

COAL AGE

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Eliminating the Janitor

FOREMOST among the reasons advanced for the use of oil in place of coal for domestic purposes is that the janitor is eliminated, whereas with coal it is difficult to dispense with him, the ash being in a cellar below the street level and the ashes having to be carried up to the sidewalk.

However, that difficulty would be greatly reduced if the quantity of ash were lessened by the better cleaning of coal. Ash cans of decreased height and weight might be used such as the householder, though an office man, could readily handle. In this way the cost of warming a dwelling house would be reduced about \$60 a year.

Ash in domestic coal furnishes a difficult problem to the householder. What he spends in removing it, if he hires a janitor, would enable him to buy about four tons more coal, though some householders are able to solve the problem by hiring men whose sole duty it is to carry the cans from the cellar and place them on the street or by bribing the city ash men to enter the cellar and remove the cans, contrary in most cases to the city ordinance. If the anthracite man would oust oil he can do it no better than by reducing the ash content of his product.

All Ways Are Clear

AS THE result of the election the whole nation breathes more freely. The Republican and Democratic candidates for President were both men of high ideals, of excellent record and noble purpose. Of the other important candidate, La Follette, we are not disposed to speak with disfavor, but he was endeavoring to obtain office by advocating principles which would have been highly detrimental to the nation's well being and progress.

La Follette would have the railroads and coal mines operated by National commissions though every question that would confront such administrative bodies would be a political issue. The commissioners would ask: What action would menace the life of the commission? What decision would alienate the voter? Expedient political action would be the test of every question. Economy would not live long in such an atmosphere. Every problem would be solved by considerations of the moment rather than by larger questions of economical operation. As a result the industries operated by government would be inflated. Uneconomical plants would continue to be operated. Necessarily unprofitable roads would be built and maintained, and the effort of every congressman would be expended in getting favors for his own section.

We all remember how repair docks were kept in operation and extended when they could be reached no

longer by naval vessels of the size which needed repair. We know how post-offices were constructed not on the basis of population and post-office needs but in response to clamor and to make certain congressmen "solid" with their constituencies. We know how even during the war decisions sometimes were made to satisfy certain voting necessities, at places that no manufacturer would choose for such enterprises.

But these facts, though they must not be forgotten, do not now menace us. We have for four, and we believe for many, years the promise of a clear way before us in which we shall be able to direct our attention to development and progress. Industry is free once more to advance, and the sentiment is abroad that we are going to have better times, less unemployment, less uncertainty and greater rewards for all who serve the public by their activity and labor. The farmer, whose sound judgment was, for a moment, questioned, has proved to be no supporter of La Follette, nationalization, syndicalism or socialism. The public has rendered a verdict that this country is safest under constitutional rule and under a system of government which protects the weak without hobbling the strong. The prospects are brighter than were for a while expected. For this we are grateful, the more that for a time the nation had to endure an extremely inclement political atmosphere.

Near and Far

IF NEWSPAPER statements are to be believed the President is going to favor railroad tariffs giving lower rates per mile to the farmers located in places distant from points of consumption, thus depriving those that are near the market of their natural advantage. The duty of providing the railroads with an adequate income is to be shouldered by those shipping less bulky products. This will arouse much opposition and may never get beyond the point of discussion.

The interest of the coal trade in this action is obvious. The high-volatile coals, having been deprived of their natural market by freight rates based on equality in transportation charges, or rather on a supposed equality in competition, instead of on distance of transportation, have been anxious to have these rates revised. It naturally will be conceded that if farm rates, which have been quite largely based on distance are now to be based on competitive equality, coal rates that have been largely based on the latter plan will hardly be revised so as to return to the former. The Interstate Commerce Commission or Congress can hardly be so inconsistent, at least in making new decisions.

Thus the battle rages, with victory seemingly veering toward those who have been led by circumstance and preference to locate in the more remote regions. As far as farming is concerned we cannot see why any

dispensation should be given to those who inhabit the rich valleys of Utah. It has never been claimed hitherto that the agriculturists around Salt Lake City needed government help and favor.

Put the Price Too High

MUCH of the trouble with coal has been that its price has been put too high. The Coal Trust, which is a labor and not a capital trust, has made the mistake that trusts too often make. They believe they can set the price where they will, and then they place it higher than the traffic will bear.

The anthracite-miner trust has lost some business by that fact. Oil and coke have made inroads, because the anthracite wage scale was unduly boosted and prices became excessively high. In the union bituminous mines the same mistake was made, but in that case the effect on the labor trust was worse, because the consumer in many cases could buy from non-union mines.

Labor trusts can easily put the price too high. They should remember that the railroads when they held unrestrained power were disposed to ask no more than would keep business coming to their roads. They called it charging "all that the traffic would bear." They were excoriated for it, but the wrong they did was less heinous and less self-destructive than charging more than the traffic will bear. Self-advantage and responsibility to the public combine to condemn any such action.

The Dollar Mark

MANY DOLLARS there be that will neither ring nor resist the pressure of the teeth. We cannot measure everything in dollars. For instance, what is gained at conventions and institutes cannot always be written down in hard currency, but unfortunately the cost of the trip may be so evaluated. We can write the expenditure down in serried figures. In fact most of these costs are so written, and sometimes the time cost is also thus estimated. Therein lies the danger. The rewards are intangible; but the money paid for them is so readily measured.

But if we look back into history, we shall find that the ages when men traveled, when the brightest minds met, were ages of progress and the times when men stayed at home and relied on their own unaided wisdom were days of retrogression. It is true many great men have come from closely isolated territories, but so long as they stayed closed in by mountains, desert plains, ill-constructed roads or tempestuous seas they showed the evil effects of isolation.

The convention habit is going to be one of the quickeners of civilization. Those who avoid it will still follow their several narrowed ways, full of prejudice and lacking in purpose. The convention stimulates thought, lays in fact a premium on it, gives a driving force to life. The mental muscles are stimulated by it. Functions sterile for lack of use are pricked into life, at the expense, it is true, of time, of railroad fare and hotel charges, but who shall say the cost is greater than the profit, the outlay greater than that which is laid by.

The Coal Mining Institute of America, the most numerous attended of our coal-mine meetings, meets this year with a good program, not least of all its prolific question box, which if it misses fire occasionally

always brings up much of sterling value. The papers on haulage by belt, on recent electrical development and on rock dusting will be delivered by the most competent of men. They will give those attending the meeting a new "slant" on mine operation and safety, and even better yet they will promote thought and study.

They will have ramifications in the mining industry that will be difficult to trace back, for progress in one direction gives to an active mind power to develop in other ways. No sooner is one science accelerated than all move forward together. We trust that the Coal Mining Institute of America will be well attended and that the habit of gaging the dollar by mere physical tests will be, at least temporarily, abandoned, for the difference in the quality of mind between the employer and employee rests largely in this matter of mental contacts.

Who Excuses Himself Is His Own Condemner

OF ALL FRENCH proverbs none is perhaps more apt than *Qui s'excuse s'accuse*, which may be translated "He who excuses himself is his own accuser." The best manner of meeting a possible accusation is by establishing a good reputation and doing it before the charge is brought. Then when the public hears unfavorable comment it has its mind already made up and meets the accusation with the words: "It cannot be true or if it should be true there are extenuating circumstances. Let us wait to hear the whole matter. You will see then what you shall see."

The very worst time to answer a charge is when the charge is made. The public accepts what it hears first, and to dislodge a formed prejudice is many times as hard as to put an idea in an unprejudiced mind. That is the trouble with the coal industry and with the coal companies individually. The industry and the companies go along silently, always "out" to callers, always silent as to their good deeds, always unwilling to give information as to their progress—and then a charge comes. The industry or the company is arraigned; it has been callous as to the rights and comforts of its employees, it has been ill-disposed to progress and the charge is unanswerable, not because there is no defense but because the judge, the public, is too lazy or too prejudiced to listen. The brain cells of the hearer have already grouped themselves and the reply is "You will have to show me."

We have in mind some corporations, incensed at criticism and rightly so, which, nevertheless, keep their lights under an impenetrable bushel. Will their good deeds serve them? We think not. We recall on the other hand two manufacturers who gave the press good opportunity to learn about their humanitarian work, their *bonhomie*, their aggressive methods in promoting safety and economy. Later came ominous charges against one of them, frequently repeated, but the public would not hear them. The people even gloried in their profits. The manufacturer thus bitterly attacked made no defense. He did not need to do so. The good he had done, which the public knew and recognized, carried conviction with it. One of the railroad companies attained a similar repute and not only did it save its reputation but it gave its president such a standing that no matter what was said—and much indeed was said against him—he continued in public favor and still retains much of it.

H. S. Gay Long Ago Tried Out "Modified Longwall"

His 1905 Efforts at Full Retreating Longwall Failed Because of Uncontrollable Roof But Rib-Slabbing in Rooms 300 x 80 Ft. Was Safer and Raised Output to 9.2 Tons a Day per Inside Employee

BY ALPHONSE F. BROSKY
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ALTHOUGH many coal-mining men still scoff at those who ponder the possibilities of converting room-and-pillar mines to modified longwall methods, it is a fact that the ranks of the longwall thinkers are thickening. Longwall mining in one modified form or another has been adopted in many an American mine, following trails blazed by such men as Harry S. Gay, Sr. So his longwall experiments of 20 years ago are coming to have a new interest for coal men of today.

As early as 1905, in Logan County of West Virginia, Mr. Gay, then an active mining engineer but now a resident of Baltimore, Md., began his trail blazing. He wrote at the time: "Not having the vision of a prophet, I determined on the first suitable opportunity to try some system of modified longwall." After following his profession for a number of years in the anthracite field of Pennsylvania, in 1904 he had moved to

Logan, W. Va., where he opened up the Gay mine of the Gay Coal & Coke Co. The following year he started an experiment that was destined to modify longwall mining so as to meet the conditions imposed by the market and the particular seam to be worked and to make it less costly than room-and-pillar work.

The Gay mine was opened up in a tract of the Cedar Grove seam (known as the Island Creek seam in Logan County), lying 200 ft. above the level of the Guyan River and dipping southwesterly about 1½ per cent. In this tract the average thickness of the seam is 67 in. The coal in the old sections of the mine where the early experiments were made is free of partings. Above it the cover attains a maximum thickness of about 1,000 ft., the average being about 500 ft.

ROOF WAS SOUND BUT DIFFICULT TO CONTROL

When the experiments were first started, the field being new, little was known about the character of the roof except that it was apparently sound. The few previous experiments in applying a longwall system in mining West Virginia seams were without success because the action of the roof could not be controlled. Realizing this difficulty, portable posts were designed by Mr. Gay to support the roof near the face of the workings and to obviate the immense supply of timbers which his experiments otherwise would have required. Details of this type of post, save that it was mounted on a heavy hydraulic head, and supported a heavy roof

load, are of no immediate importance because its use was discontinued long ago.

It was proposed to mine by a longwall retreating system the block of coal given to the first experiment. Accordingly, the section shown in Fig. 1 was developed by the two longitudinal sets of entries, Nos. 4 and 5, and the No. 2 transverse set of entries, which laid off a block 300 ft. wide and 600 ft. long. The aircourses and haulage entries were driven 10 ft. wide and were separated by a pillar 60 ft. wide.

HERE WAS VISION

OVER sixteen years ago Harry S. Gay, Sr., dreamed of loading machines and other means to help perform the work of mining coal. Earlier than that he made use of cutting machines of the chain type and an electric drill. Some of these machines are common now but even today electric drills are used in only a few mines, partly because of union labor's demand for the lion's share of the saving. Experiments in modified longwall systems are being tried in some mines today, of a character not unlike those tried nearly twenty years ago by Mr. Gay.

As the retreating wall moved away from No. 2 entry, the span of roof left behind did not break freely, but tended to act as a cantilever over the face of the coal. After this wall had retreated more than 30 ft., rows of props on 15-ft. centers were set at 8- to 10-ft. intervals. Later, when the roof span became so wide that the props did not seem to support the roof adequately near the face, the portable posts were brought into use. The first row of portable posts was placed on 6-ft. centers and 11 ft. from the face, when the wall had retreated 60 ft. from the starting line. Following the next retreat of 6 ft., the depth of a cut, a second row of portable posts was set 3 ft. in advance of the first row. Thereafter, with each retreat equivalent to the depth of one cut, the last row of portable posts was safely moved one at a time to an advanced position.

The retreating wall was cut by an electric cutting machine of the longwall type. This particular machine was replaced some months later by a modern chain machine that undercut as much as 500 tons of coal in 8½ hr. Shot holes were drilled, 6 ft. deep on 10-ft. centers, with an electric drill, by the use of which two men were enabled to drill and shoot the entire 300-ft. face in 10 hr.

As indicated by the arrows in Fig. 1, the mine cars passed by the face in one direction following the dip from No. 5 entry to No. 4 entry. Under this system, each day one mule could deliver 100 tons of coal from the working face to a side track located about 1,000 ft. away. On the completion of each successive cut the entry track was shortened and the room track was shifted 6 ft. toward the face. Details of the arrangement of the track and roof supports with respect to the face are exhibited in Fig. 2.

No particular difficulty was met in the work, which proceeded as already described, until the wall had re-

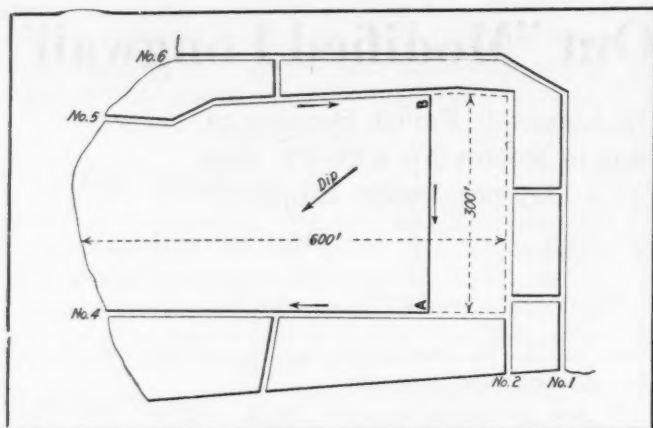


Fig. 1—Full Retreating Longwall Wouldn't Work Here

An attempt to mine the face A B by this type of longwall method failed because the roof failed to cave as promptly as desired. It was realized that the area of roof unsupported was so great that life would be endangered should any more coal be taken out in that area.

treated a distance of 100 ft. Up to this point in the experiment the roof manifested no tendency to break. It was decided, therefore, to meet the conditions which sometime or other—the sooner the better—would have to be confronted.

So, the track was shifted close to the face, 6 ft. from which 100 portable posts in a single row were set. Then 18 holes were drilled in the roof to a depth of 6 ft. in a line 10 ft. from the posts and charged with dynamite. Twenty of the largest props (not portable posts) were drilled and charged with dynamite for the purpose of lessening the resistance to a fall of roof behind the "breaker row." These charges were fired by hand in quick succession.

A period of waiting followed, in which the roof forces were allowed to spend themselves. An examination revealed the dislodgment of a block of roof having a length of about 100 ft. that had sheared close to the posts on one side and near the opposite rib on the other. The space left by the fall disclosed a bed of strong sand slate without a parting in a thickness of 30 ft. Thus

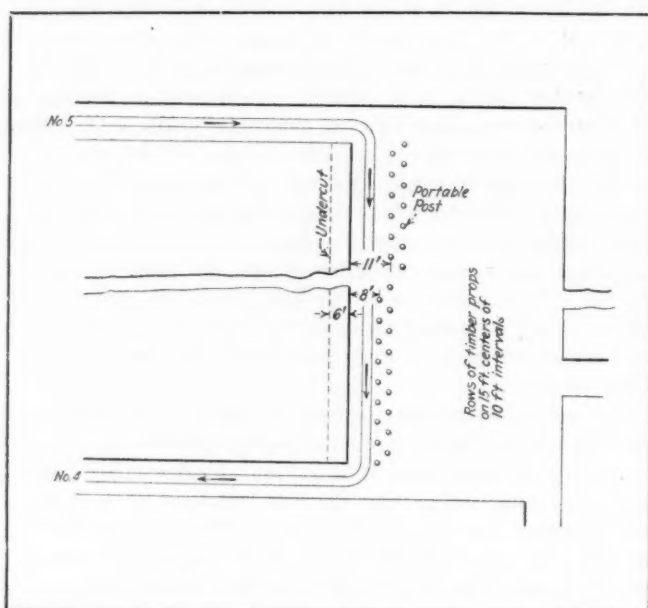


Fig. 2—Provisions Made to Assure Safety

This scheme was tried when the roof failed to fall as anticipated. The distance between the closest row of posts and the face of the coal was 8 ft. After the face was cut the unsupported roof span was increased to 14 ft. When falls were expected the posts were placed closer to the face.

the examination foretold the difficulties that were to be expected in prosecuting a true longwall system in this seam of coal. Along another portion of the working place the slate broke over the posts and lightly buried 50 ft. of the track. The remaining length—150 ft.—of the roof was undisturbed.

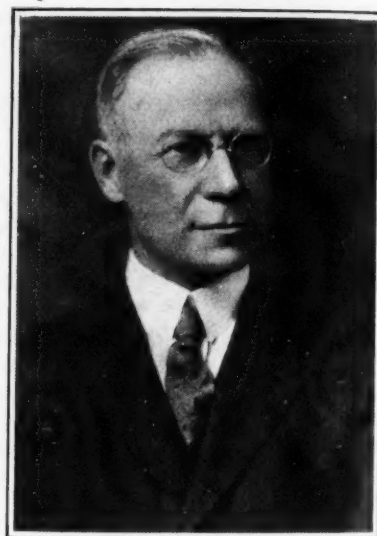
Blasting of the roof reduced the daily tonnage from the face about one-half. The work was continued along the lines described for a period of six weeks following the first fall of roof, during which time it became evident that the method could not be continued with inexperienced labor under the conditions met. A fear was constantly entertained that a mass of rock might break over the posts and endanger the lives of the workmen. At this stage, the experiment was discontinued.

Though Mr. Gay was forced to admit defeat in the pursuance of a system of full retreating longwall mining, because the roof was not stratified sufficiently to break behind the posts, he planned a modification of that system which would retain many of its advantages.

In his first experiment he demonstrated to his own satisfaction that even under the most adverse conditions that he met, the cost of mining was less than that of the room-and-pillar system. Among other factors, the saving was attributed to the facility with which coal could be moved, the concentration of labor—and that of the less skilled kind—and the simplicity of the ventilation. In a paper describing his early experiments before the Coal Mining Institute of America, Dec. 19, 1906, Mr. Gay gives in the two following paragraphs his conditions and assumptions for his second plan of mining:

"Any method that might be adopted, other than those in vogue in this locality, would have to comply with several conditions: (1) The percentage of coal won must equal on an average that of the other mines in the same coal field. (2) Since all the coal could not be removed by a single operation, pillars of some sort were a natural consequence; therefore, sufficient pillars must be left to sustain the roof for a period of time that would allow each section to be mined in safety. (3) The proportion of narrow to wide work must be such that the additional cost of the former would be absorbed by the decreased cost of the latter.

"The dimensions adopted, which satisfied the three conditions, were based on the following assumptions: (1) Since it was already demonstrated that the roof was self-supporting in a span of 120 ft., it might with perfect safety be worked in a span of 80 ft. (2) If a seam of coal will support 5,000 ft. or more of overlying strata, one-half the coal may therefore sustain 2,500 ft.



Harry S. Gay, Sr.

Who opened the Gay mine of the Gay Coal & Coke Co. at Logan, W. Va., where he conducted many interesting experiments in longwall mining.

of strata, and likewise one-fourth of the coal may sustain 1,250 ft. of strata. Thus 30-ft. pillars, with regular intervening spaces of 80 to 90 ft. between them, might for a time sustain the weight of 1,000 ft. of strata."

The working face in the second experiment was of the same length as that of the first experiment, and was mined in identically the same manner except that pillars were left standing at given intervals behind the retreating block of coal to hold the roof behind the working face. The scheme was thus resolved into a combination of room-and-pillar and longwall mining methods.

Rooms 10 ft. wide on 110-ft. centers were driven transversely into the block of coal, and then widened out to a width of 80 ft., one at a time, in the retreat by slabbing. This left a 30-ft. pillar between each worked-out room. These rooms in reality were sub-entries while the slab cuts differ in no way from those made in the retreating longwall of the first experiment. This layout is shown in Fig. 3.

Trouble with the roof was encountered only near

These rooms were mined in the retreat commencing with No. 12 room which was mined out to a width of 40 ft. before a row of ordinary timber props, of 8- to 10-in. diameter on 15-ft. centers was set as close to the face as the work would permit. When this room attained a width of 50 ft., another row of timber props was set. Thereafter, for each increase of 10 ft. in the width of the room, a row of the portable posts on 10-ft. centers was set and moved ahead as required. The same procedure was followed in working the remaining rooms, one at a time. The action of the roof was manifested to an extent by its effect on the timber props.

As a room approached its maximum width the likelihood of a break in the roof and its inherent dangers increased in proportion; and, therefore, as the room was widened out, greater care in the work and more supervision were required. No subsidence was noted in any of the seven rooms except in No. 12 room, in which the manifestation was only slightly perceptible. The maximum thickness of cover over these rooms was 300 ft.

It was found that 26 men could mine as much as 300

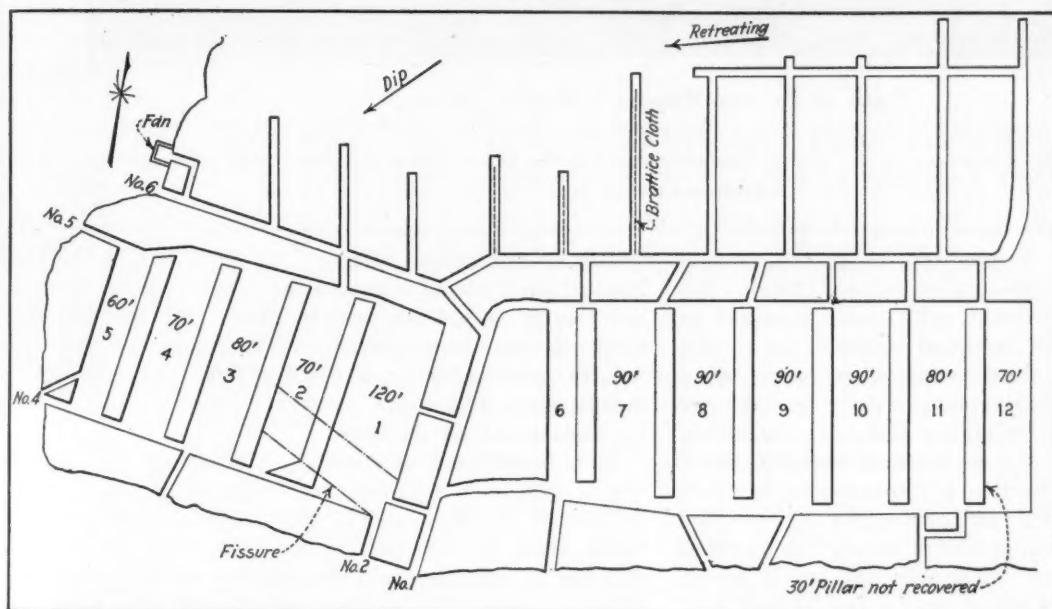


FIG. 3

Room Slabbing

When the roof hung stubbornly in long spans behind the longwall working face of Fig. 2, 10-ft. places on 110- or 120-ft. centers were driven and the intervening pillars were slabbed, forming 90-ft. rooms, leaving a 30-ft. pillar to hold the roof.

the outcrop, where the rooms were driven as narrow as 60 ft. and auxiliary props were set close to the working face to hold up loose fragments of slate. As a consequence, the details of this plan were believed to meet the requirements of a hypothetical successful system.

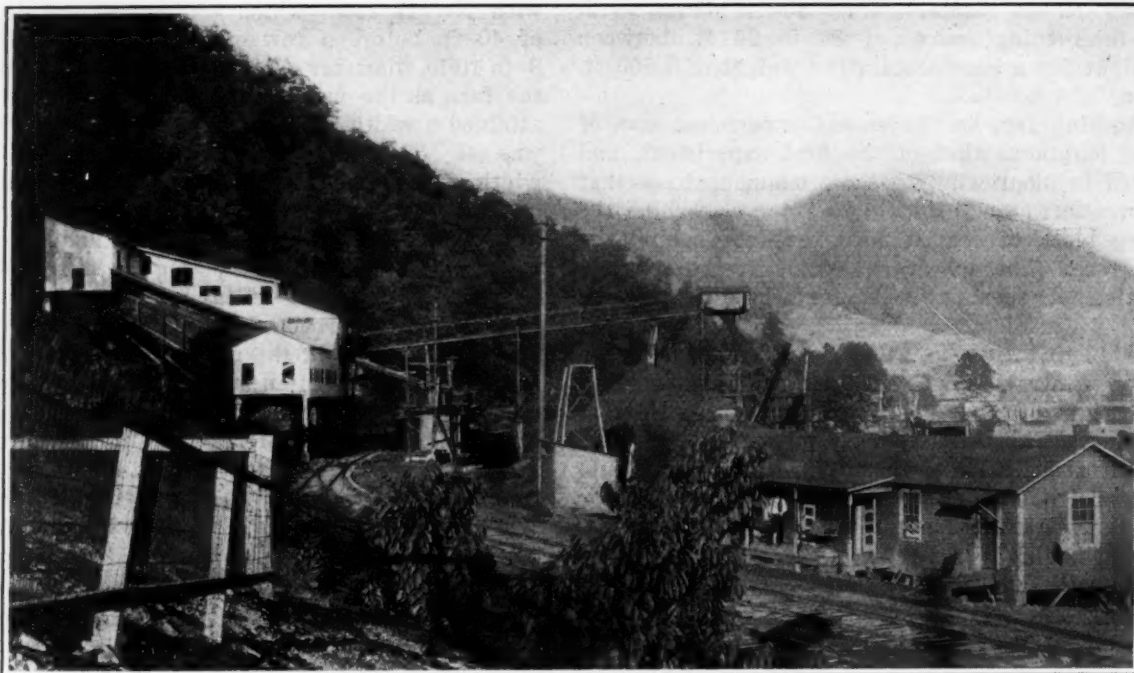
At all times the labor worked on solid coal while the pillars left standing and abandoned in the retreat served to stop any general squeeze from spreading any further than the worked-out territory. One objection to the plan was the driving of single narrow rooms into a block of solid coal for a distance of 300 ft., necessitating the hanging of brattice cloth for ventilation in the room being driven.

Freedom from roof trouble under normal conditions in mining out rooms 80 ft. wide led to the belief that the latter could be slabbed to a width of 90 ft., leaving the usual 30-ft. pillar between them. With this object in mind No. 4 and No. 5 entries were driven eastward from No. 1 entry to the boundary line. This development opened up a small panel into which sub-entries were driven from two ends on 120-ft. centers for the widening out of rooms Nos. 6 to 12 inclusive, as may be seen from Fig. 3.

tons per day from one room, and that 12 men could yield an additional 60 tons per day in driving the entries required to maintain adequate development for a uniform output from a room. A total of 39 men mined 360 tons per day, or an average output in the section per inside man per day of 9.2 tons. The average output per man was slightly more or less depending upon the conditions met in mining. At that time in the best of the mines of West Virginia and Pennsylvania using the room-and-pillar system, the average daily output per inside man seldom exceeded 5 tons.

To produce 360 tons from a section, of which 300 tons came from a room and 60 tons from the development of entries, the labor of 39 men was divided as follows:

One Room	Entries
1 Foreman	6 Loaders
2 Machine men	2 Machine men
2 Shotfirers	2 Mule drivers
4 Bottom-scrapers	2 Tracklayers
12 Loaders	
4 Mule drivers	
1 Tracklayer	
1 Timber man	



Tipple of the Gay Mine as It Appears Today

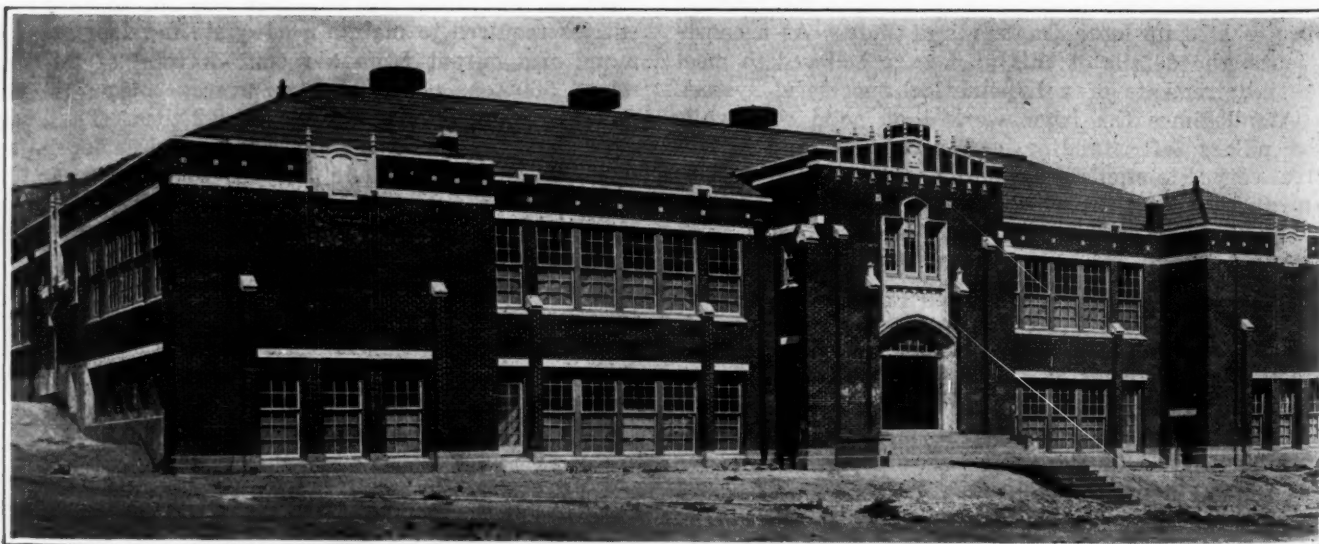
On the right can be seen the valley of the Guyan River. The coal (the Island Creek or Cedar Grove) lies high up in the hills 200 ft. above water level among the marvelous woods that have made West Virginia in the matter of scenery one of the most fortunate states in the Union. Each day about 400 tons of slack is dumped on the storage pile and an equal quantity is hauled to a power plant nearby on the right.

Of great interest is a comparison of the results obtained in mining by the true longwall system, described as the first experiment, with those obtained in mining by the system of modified longwall in rooms. A study of the two systems while they were being tried showed that the former yielded a daily tonnage per inside employee 20 per cent higher than did the latter. Had the true longwall system worked successfully it would have permitted close to a 100-per-cent recovery in the Gay mine as against 80 per cent by the modified system. But from the standpoint of safety the modified system showed a decided advantage and, as a consequence, required the services of only a few skilled men.

It is interesting to know that Mr. Gay had an early

dream of mechanical mining. In 1906, before the Coal Mining Institute of America, he remarked, "A mechanical loader is not an impossibility, and the day may come, in some mines, when every division of the work will be performed or greatly assisted by mechanical means, and 10 tons per inside employee will be a regular and steady production."

In a later issue of *Coal Age* an article will appear which describes further modifications of the systems delineated in this article, including the system now being used in the Gay mine. Mr. Gay has tried a number of loading machines, and is now using two with great success. The coming article will deal also with mechanical loading.



Good Coal Camps Sometimes Have Good Schools

Here is the new public school at the model coal town of Hlawatha, owned by the United States Fuel Co., in Utah. Twelve teachers are employed using the most modern methods and school equipment to be found in any city educational system. A handsome and comfortable dormitory for teachers, not shown in this picture, helps make life in Hlawatha attractive for these women.

Mine Locomotives, Their Operation and Control

Why Cable Reels Should Not Be Driven by Locomotive Axles —
Should Gathering Locomotives Run Fast or Slow? — Difficulties
with Series-Parallel Controllers—Limitations of Rotary Converters

BY F. L. STONE

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FIRST among the achievements in the use of electricity for the reduction of mining costs was the installation of electric mine locomotives. Long before power companies thought of supplying current to the mines, electric locomotives were busy underground hauling loaded cars from the working face and returning empties. Their power supply usually consisted of small direct-connected engine-driven generator units in sizes up to 300 kw. To compensate for excessive line drop the generators were usually heavily over-compounded.

In this manner the early operators hoped to reduce their expenditure for copper wire. Later experience, however, seems to indicate that it is better practice to maintain as high a voltage as practicable at the substations and make a moderate investment in copper, thereby keeping the voltage up and the energy loss down.

The scheme of wiring and underground transmission varies considerably with local conditions. Sometimes cables are run down the main shaft; in other instances a borehole is put down as close as possible to the center of distribution and a feeder cable dropped through the borehole. Usually, various parts of the mine wiring are sectionalized so that power may be cut off in any part of the mine desired. Since the early days the small engine-driven generators have been dispensed with, and modern substations installed.

The design of the locomotive has changed materially as conditions surrounding its operation have become more thoroughly understood by designing engineers. Mine locomotives may be divided into two general classes, namely: the main-line haulage locomotives and the gathering locomotives; the former, as their name indicates, haul long strings of cars from various central points where the trips are made up.

The gathering locomotive differs from the main-line locomotive in that it is usually lighter, is of shorter wheel base and carries with it a cable reel. The size of the gathering locomotives ordinarily used varies from 3 to 8 tons. The cable reel is usually driven by a torque motor which when the reel is in action is left across the line permanently and thus a continuous torque is exerted on the reel.

From a paper on "Electricity in Mines" read at Pacific Coast Convention of the American Institute of Electrical Engineers, Pasadena, Cal., Oct. 13-17. A part of the same paper will be found in last week's issue.

One end of the cable is electrically connected to the trolley or other source of power, and when a locomotive enters a room the cable reel is unwound against the torque of the motor. The torque developed by the motor is sufficient to reel up the cable as the locomotive comes out of the room.

Cable reels are built in two distinct forms, one a comparatively long drum of small diameter placed at

one end of the locomotive and the other a large diameter drum with a narrow face, placed on top of the locomotive with its axis vertical. The first requires a mechanical guide to insure the proper coiling of the cable. The short-faced large-diameter reel requires no such device, but, on the other hand, usually adds a few inches to the overall height of the locomotive.

Cable reels of both types were originally mechanically driven from the locomotive axles, but this was found unsatisfactory

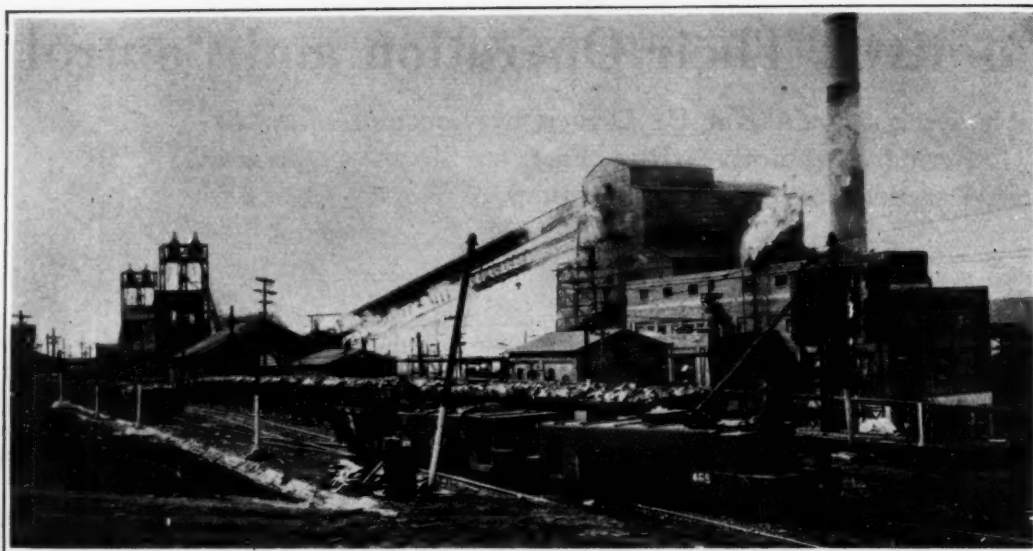
because in coming out of a room of any considerable pitch or grade the locomotive runner is likely to lock the wheels. This would stop the cable reel winding in and would allow the locomotive to run over and destroy the cable. Gathering locomotives are usually designed to operate at a speed of from 6 to 7 m.p.h. at the normal rated drawbar pull.

Quite recently operators have questioned whether it would not be better to reduce this speed to approximately 3 or 3½ m.p.h., it being found that few gathering locomotives exceed this speed and that the locomotive runners waste much energy, for they run their motors in parallel with a large quantity of resistance in series. A slow-speed gathering locomotive was designed and installed for one of the large coal companies, and it was found that the daily power consumption was greatly reduced with practically no reduction in the output of coal.

The question naturally suggests itself, why, seeing that most locomotives have two motors and that high speed is obtained by operating the motors in parallel, a series-parallel controller could not be used, which would give practically half speed when operating the motors in series, and also give high speed with motors in parallel when desired. This scheme is entirely feasible and is open to but one criticism, namely, that the locomotive runners will not operate their motors in series but prefer to run in parallel on resistance, notwithstanding all rules and instructions to the contrary.

ARE GATHERING LOCOMOTIVES DESIGNED TO TRAVEL TOO FAST?

ONE company has found that the daily power consumption is greatly reduced and the tonnage not materially lessened by reducing the rated speed of gathering locomotives, for motor-men usually leave much resistance in the circuit, it not being safe or convenient to run in rooms at high speed. The answer to the question is found in the definition of a gathering locomotive. If long runs are made over heading track with short trips or in changing from one gathering center to another, speed is desirable. If the gathering is merely from room to heading the rated speed will not be used.



Tandem Unit

Where large loads must be hauled some companies use extra heavy single locomotives while others use two moderate-sized units in tandem. There are few, if any, locomotives larger than 20 tons in the anthracite region because here the practice is to use tandem units on stiff grades or long hauls. Single locomotives weighing 30 or more tons are not uncommon in the bituminous coal fields.

The electrical equipment on the gathering locomotives generally consists of two motors totally inclosed and rated on a 75-deg. C. rise full-load one-hour basis. The design of the motor has been materially improved these past few years and today the gathering-locomotive motor operates about as well as any standard industrial motor.

ANTI-FRICTION BEARINGS REDUCE BREAKDOWNS

It is equipped with interpoles, and in the better designs has liberally proportioned anti-friction bearings. This latter feature alone has cut down the locomotive repair bill materially. The old-style bearings wore badly, and as the inspection was not of the best, the locomotive would run until its armature struck the pole pieces which usually necessitated a complete rewinding. With anti-friction bearings this complaint is practically unknown.

Most controllers are of the series-parallel type, so well known that no description of them is necessary. Within the past few years, however, one of the large manufacturing companies has built as a standard part of its line a controller of the series-parallel type with an auxiliary cylinder, which, when moved into the proper position, gives the operator complete control of his trip by a dynamic brake action of the motors. This arrangement lightens the manual work of the mine locomotive runner and has proved popular where installed.

The place of the storage-battery locomotive is in my opinion rather limited. Many locomotives of this type have failed mainly because they have been used under conditions for which they were unsuited. Locomotives were put on long hauls that were designed only for short ones. The result was a rapid battery deterioration and consequently heavy renewal charges. I do not mean to indicate by this that the storage-battery locomotive has no field in the mine. In many cases it has a field, but it is not nearly so general as was first anticipated.

Properly designed and operated, the storage-battery mine locomotive has a battery large enough to carry it through a day of normal operating conditions and after an all-night charge is ready for service the following morning. Batteries are usually mounted in a box which is easily removable from the locomotive, so that a new battery can be substituted when desired. The standard speeds of battery locomotives do not exceed 4 m.p.h. at rated drawbar pull. The direct current for charging a storage battery is furnished usually from a motor-generator set installed in the charging room and controlled through a battery-charging panel.

Main-line locomotives are of the same general construction as cable-reel locomotives. Their function as the name indicates is to operate along the main haulageways transporting loaded cars to the foot of the shaft and empties to some central point. In sizes they

Gathering Type

Many haulage accidents are due to the manner in which locomotives are maintained—or rather not maintained. The headlight on this locomotive once was new, as also was the controller, which is now half off ready to flash an arc at the motorman's arm or spit copper into his eyes. Abuse, not use, is the cause for high maintenance costs.



run usually from 6 to 30 tons. The motors are rated on the same basis as the gathering locomotives, and the control is of the series-parallel type.

SERIES-PARALLEL CONTROL FOR BATTERY UNITS

One comparatively recent improvement developed for haulage locomotives is the substitution of the ordinary series-parallel controller by a master control and contactors. The main-line currents are handled on contactors of the same general design as those used in street-railway work. Locomotives so equipped have created a favorable impression, and this method of handling main-line currents on contactors in all probability will be adopted by all manufacturers of trolley-type locomotives.

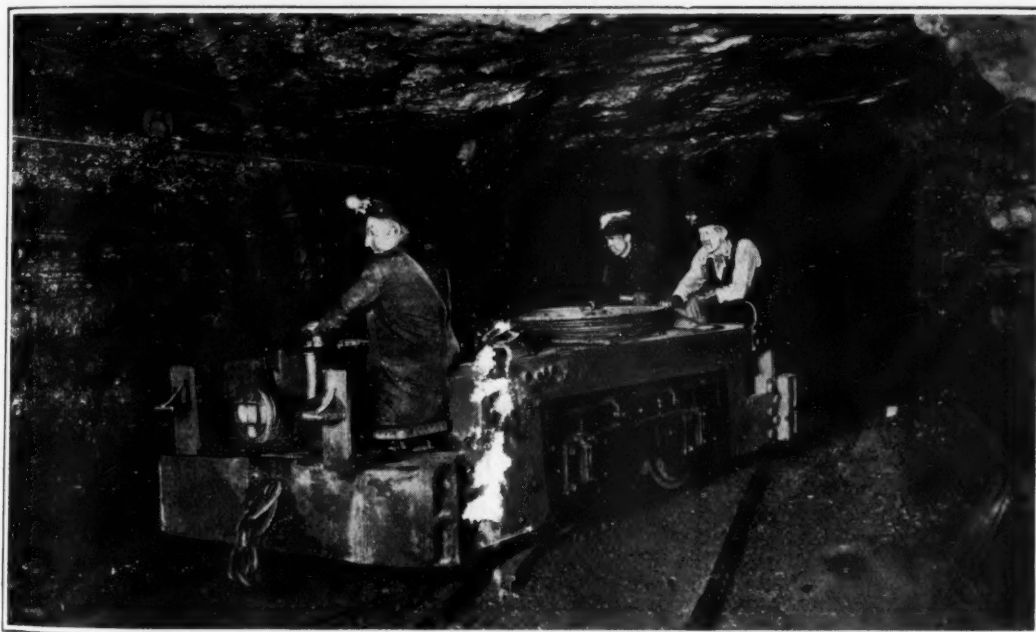
Another important change of design in mine locomotives of all types is in the method of carrying the weight on the axles. Leaf springs with equalizing levers are arranged so that an equal weight is carried on each wheel irrespective of track conditions. This is obviously of great advantage when the locomotive

outdoor or indoor type and is designed along the same lines as similar step-down substations in other industrial work.

Conversion from alternating current to direct current is accomplished either through a motor-generator set or a synchronous converter. If the synchronous converter is used, further transformation of the alternating-current voltage is necessary. If the motor-generator set is used, a motor can be operated directly from the 2,200-volt bus.

WHEN TO USE A SYNCHRONOUS CONVERTER

Many engineers fail quite seriously to appreciate the principles which dictate the choice between a motor-generator set and a synchronous converter. At first glance it would seem as though the synchronous converter, because of its higher efficiency, should be used in all places. The determining factor lies largely in the nature of the power supply. If the operator is sure of a constant-voltage supply and does not require any over-compounding of the voltage and is in no need



A Go-Getter

There is much questioning in the minds of many men as to the relative values of a trolley locomotive equipped with a cable reel and a battery locomotive. Undoubtedly each has inherent advantages and the only way to make a proper selection is to solve each haulage problem by itself, otherwise one or the other type locomotive may be misapplied.

must travel over rough mine track. In the older types of locomotives when operating on uneven tracks, the weight on the wheels varied greatly, which in turn reacted upon the drawbar pull. The general arrangement of these levers and equalizing devices can be seen in the illustrations.

The larger locomotives are equipped with air brakes and a suitable compressor. The usual motor equipment on modern locomotives is of such capacity as to give approximately 10 hp. per ton of weight on the drivers, the rating being as before stated on a basis of 75 deg. C. rise at rated drawbar pull for one hour.

No practical mine locomotive has been built using alternating-current motors. It, therefore, becomes necessary to provide the locomotives with direct current. Power is delivered to the mines in the form of high-voltage alternating current. This power must be transformed to a suitable voltage and then such of it as is necessary must be converted to direct current for supplying the mine locomotives and mining machines for undercutting the coal.

The step-down transformers are of the usual type transforming the transmission voltage to 2,200 volts. The transformer end of the substation may be of the

of power-factor correction, then the indications point to a synchronous converter.

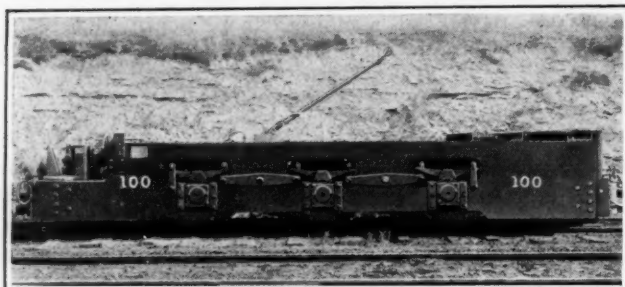
If, however, the line voltage is variable, any percentage reduction in voltage on the alternating-current side will produce a corresponding reduction on the direct-current side wherever a synchronous converter is used. This reduction in voltage means to the operator a reduction in speed of practically every piece of machinery operating on the direct-current system which reacts in practically the same percentage on his output. If he requires power-factor correction, standard mine motor-generator sets are designed to operate normally at full load with 80 per cent leading power-factor in the synchronous motor.

Synchronous converters cannot be used for power-factor correction beyond operating them at unity power factor. The direct-current voltage of the motor-generator set can be held constant irrespective of the alternating-current voltage fluctuations. The generators of the motor-generator sets can be readily compounded if it is so desired.

The load on a motor-generator set is extremely variable and the set must be built to withstand and commutate satisfactorily 100 per cent overload momen-

tarily and should be capable of carrying 50 per cent overload for 2 hr. without any injurious temperatures resulting.

The control of power-converting apparatus and the units themselves must be capable of withstanding numerous short circuits. One side of the direct-current bus is always grounded. Consequently, the fall



All Three Motors Do Their Work

To permit each motor to take its share of the load equalizing members inter-connect the three axles under this unusual locomotive.

of a trolley wire in the mine, which is a frequent occurrence due to faulty roof conditions, will cause a dead short circuit. The control must be capable of removing this short circuit from the generator as quickly as possible.

In large operations it is common to find underground substations working in parallel with stations on the surface. The alternating current supply for these underground stations may be taken down through a borehole or when the proper precautions are taken may be carried through the airway or even through the haulage-way to the substation. The voltage of the direct-current power supply for mines is either approximately 250 volts or 500 volts, the higher voltage installations becoming scarcer as time goes on.

SUBSTATIONS NOT SHUT DOWN BY LOAD FAILURE

Many of the modern substations are equipped with full-automatic features exactly the same as many of the railway automatic substations with a possible exception that I know of no mine substation which shuts down on failure of load. This added feature would not be practical in most mines as the load is varying continually in the substation from a maximum to minimum at short intervals of time.

The automatic features, however, which are included are as listed below. These protective features apply to both synchronous converter and motor-generator substations containing one or more units and are arranged to protect against, alternating-current overload, direct-current overload, direct-current reverse power, direct-current reverse polarity, alternating-current undervoltage, loss of motor excitation, loss of generator excitation, single-phase starting, imperfect starting, overheated bearings, overheated windings, and overspeed.

Perhaps the most interesting feature of automatic control is the direct-current breaker which will open on an overload or short circuit and will remain open until the short circuit has been removed, after which it will close automatically. In view of the many short circuits to which substation apparatus is subjected, some few operators have installed what is known as a high-speed circuit breaker.

With the ordinary circuit breaker much time elapses from the time the short circuit occurs until it is stopped

by the circuit breaker, and frequently machines will arc over under this condition. Even if they fail to arc over much burning of the brushes and sparking of the commutator ensues. The high-speed circuit breaker will completely disconnect the machine from the line in less than 0.01 sec. This rapid action prevents the current from rising to any high value beyond the setting of the circuit breaker and consequently it takes the shock of a dead short circuit from the machine.

European Mines Use Electric Current Less Than We Do

However S. D. Dimmick and H. M. Warren of Glen Alden Coal Co. Learned Something From Them About Tunnel Building and Briquetting

(An interview by R. J. Arthur, Scranton, Pa.)

AMERICAN coal mine operators have little occasion to look to Europe for suggestions on mine electrification. The coal men of Germany, Wales, Belgium and other countries of Europe have not yet overtaken the American producers in the adaptation of electricity to mining methods. Although electricity is used in European mines to perform the same services as in America, its use is restricted and less general. The quantity of electric power consumed by mines abroad cannot begin to compare with the meter readings at American collieries. However, there are interesting things to be learned in Europe's coal mines.



S. D. Dimmick

Vice-President and general manager, Glen Alden Coal Co.

The foregoing summarizes the opinion of H. M. Warren, consulting engineer of the Glen Alden Coal Co., who with S. D. Dimmick, vice-president and general manager of the company, recently returned from a tour of inspection of the mines of Wales, Scotland, Belgium and Germany. The anthracite coal company officials found many interesting features at the mining operations abroad and were greatly interested in the various methods of mining, primarily the longwall, which, while not new is seldom used in this country. A study of this method was made with particular reference to the mining of thin seams and many features noted are of particular value in developing methods of mining thin seams in this country. Much other valuable information was obtained.

NO ELECTRIFIED TRACKAGE

Throughout the mines on the continent and in Great Britain the visitors found practically no electrified trackage. Rope or chain haulage systems proved to be the most popular, and with these systems the loaded cars were usually moved at a pace not faster than a walk.

The reason for the absence of electrified track in the workings is explained in great part by the system of mining in use abroad—the longwall system—Mr. Warren found. Then again, the cars used for conveying the freshly mined coal are much smaller than those in

use in America, weighing, when loaded, about 1,500 lb. These cars are easily handled by the men in the workings and it would prove a difficult task to demonstrate that electricity would enable the more efficient movement of the cars along the operating face.

In one instance the Welsh operators have adopted electricity in a capacity used in few American mines. It was found in the inspection of one mine in Wales that at the working face the miners are aided in their work by electric lights strung overhead. The lights are moved as the face advances.

A shaking chute installed along the working face for a distance of 450 ft. and pitched at a 10-deg. angle led to the car-loading point. The coal was shoveled into this chute and the forward and backward motion moved it at a fair rate of speed to the waiting car. The chute, as well as the undercutting machine, was operated by electricity. This type of shaking chute is in use in mines in Germany and Belgium, the American visitors later learned.

The electric motor driving the chute was located in the return airway near the upper end of the chute and the coal was undercut by an electric undercutter of the bar type. As explosives are seldom required because of the pressure on the coal, hand picks, and in some mines where the chute and coal cutter are driven by compressed air, picks operated by air are used to bring down the coal.

On the surface, electricity is put to the same use in European mines as in American, but not on as large a scale. In the breakers, washeries and other coal-preparing plants electric power figures prominently. Electric shaft hoists are used quite extensively; pumps, rope haulages inside the mines are electrically operated. However, the use of pumps is not nearly as general as in the American anthracite field. For example, it was learned that European operators pump an average of not over one ton of water to a ton of coal mined, as compared with 11 tons of water to a ton of coal in the Pennsylvania anthracite field.

SMALL POWER PLANTS PROVE ADEQUATE

The power plants at the mines abroad, Mr. Warren learned, are as a rule not as large as those producing current for American mining operations. This is due, of course, to the fact that less power is used and small plants prove adequate. At the present time a movement is under way, and is especially indicated in Wales, to consolidate the various individual plants into a chain or power system as is the case with several of the hard coal companies, especially the Glen Alden Co., in this country.

This tendency was regarded by the American visitors as a manifestation of the European operators' growing appreciation of the value of electrified mines.

One of the outstanding features of mining on the continent is the enormous production of briquets, the manufacture of which in the anthracite region in this country has proved more or less of a money-losing proposition. Messrs. Warren and Dimmick saw barge load after barge load of briquets moved through the Rhine district. They were advised that most of it was reparation coal, and was the product of German operators whose methods of production of briquets have met with much success. In France, Italy and Switzerland the visitors noted that large quantities of briquets are used by the railroads, but the general practice is to



H. M. Warren
Consulting engineer, Glen
Alden Coal Co.

carry both bituminous coal and briquets on the locomotive tender.

Although several methods of preparing the briquets were in force, one in particular, which is said to be the latest and most improved, attracted the attention of the visitors.

By this system the coal was induced into a long cylinder lined with vanes. The cylinder continually revolved and dropped the coal from top to bottom as it turned. At one end of the cylinder, or kiln, as it is called, the heated binder, usually made of coal tar, was sprayed through the dropping coal by steam and compressed air. This thoroughly mixed the binder and coal and the mixture was drawn out the opposite end and conveyed to the presses. It is claimed by the advocates of this system that from 1½ to 2 per cent less binder is used than with any other method and that a better briquet is produced.

NEW METHOD OF LINING TUNNEL

Another interesting development which attracted the attention of the tourists was a new plan of lining a tunnel in deep workings to withstand the enormous pressure which sometimes will crush massive brick tunnel linings. By the new method, which the originator claims to have patented, concrete blocks are used. These were placed in the tubular passageway under construction, but one is omitted every so often in the construction and in its place a wood block is used. The wood block is a cushion relieving some of the pressure and preventing the lining from buckling. Thus far the system has been used with success. It remains to be seen what effect time will have on tunnel linings so constructed.

Economic conditions in the industry abroad were studied to some extent by the American visitors. They concluded that the dormant power of the coal industry in Germany will rise with the re-financing of that country, and with cheaper labor, advanced mining methods, excellent quality coal and lower prices Germany will compete with other European countries for the best markets.

WHO WOULD HAVE DREAMED that such a resolution as this ever would be necessary to protect the headquarters—not to mention hindquarters and other anatomical divisions of Local 944 United Mine Workers, at the sweet city of Herrin in "bloody Williamson" County, Illinois? "Be it resolved that any member of Local Union No. 944 caught with concealed weapons on him in the hall, shall be fined \$10 for the first offense, \$25 for the second offense and for the third offense shall be expelled three months and fined \$25, the fines to be paid to the man furnishing the evidence. Adopted at a regular meeting, July 8, 1924."

MINE VENTILATION seems superior to that below decks in big ships. If the Leviathan hit a rock, for instance, what protection would its vaunted 60,000 cu.ft. of air per minute be against damps?

Electric Light Plants Contemplating a Plunge Into Gas, Coke and Byproduct Business

National Electric Light Association Is Presented Lengthy Report on Coal Distillation Products—Low-Temperature Carbonization Said to Be Still Commercially Unsuccessful—Gas Making at Mines Suggested

GREATLY significant was the fact that the Prime Movers Committee of the Technical National Section has presented the National Electric Light Association with a report on the Distillation Products of Coal in which articles were contributed by A. G. Christie, V. Z. Caracristi, F. P. Coffin, Arthur D. Little, Inc., and T. C. Keating. Only A. G. Christie's remarks appear in this summary.

Coal men are less awake than the electric light officials to the possibilities of making low-temperature coke and the byproducts that go with it and the advantages, if any there be, of the complete gasification of coal at the mines. It appears that the electric light associations are taking a more fundamental interest in the study of coal treatment than the coal operators themselves. The anthracite region may well interest itself in the activity of the central power stations in planning to make a fuel that will compete with hard coal. An abstract of the report follows:

"Some thirty or more major processes for low-temperature distillation are now in varying stages of development in this and foreign countries. The available information regarding the more important of these has been ably reviewed in the 1923 report of the American Gas Association's committee on Low-Temperature Carbonization and Complete Gasification of Coal. That committee's report summarizes these processes in the statement that:

"There have been no developments along low-temperature lines in this country or in England which would justify any assumption that the art has passed from the experimental into the commercial field. Coal most certainly has not been distilled at low temperatures on a money-making scale, yielding profits sufficient to carry the operating costs and the capital charges. It has been tried experimentally; on a semi-commercial scale, and in one case in a full-sized commercial plant, but it must be recognized that so far none of these attempts has been entirely satisfactory."

"Keen interest has been displayed by various manufacturers in the subject of low-temperature distillation and a disposition to start commercial activity if and when an opportune time in the progress of the art arrives. It seems, however, that on account of its varied nature, the problem lends itself better to commercial solution by ultimate users rather than by equipment manufacturers.

"The determination of the form in which the distillation products will have maximum commercial value continues to occupy the attention of investigators. Much

progress is being made particularly in the use of low-temperature tar oils as a wood preservative. It is now becoming generally conceded that they can be used satisfactorily for this purpose.

"The increasing cost of anthracite fuel for domestic use is proving an incentive to the development of a smokeless fuel made from high-volatile coal. On the other hand, the present low prices of petroleum products act adversely where they determine the price at which certain coal-distillation products can be marketed. The particular incentive in this case is to have a satisfactory process worked out that will be available when higher prices for petroleum products prevail.

"The following statement was received from A. G. Christie, of Johns Hopkins University, as to the present status of coal distillation, and this is embodied in the report:

"Research work on the distillation products of coal during the past year has tended to emphasize more clearly the three fundamental processes that should be kept separately

in mind when discussing distillation. These processes are typified by: (a) Coke ovens, (b) low-temperature gasification, and (c) complete gasification.

"The first process produces a prime quality of coke and also yields about 10,000 cu.ft. of 550-B.t.u. gas per ton of coal, together with 12 gal. of cracked oils and pitch. The second process per ton of coal treated produces about 20 gal. of first-quality oils, about 4,000 cu.ft. of gas with a heating value from 600 to 800 B.t.u. per cubic foot and a coke containing enough volatile matter so that it can be marketed for domestic purposes as a substitute for anthracite. The third process produces the maximum quantity of heat in gaseous form but of varying volume and composition and of low heat value per cubic foot, together with about 20 gal. of oil but no coke.

COKE OVENS, BAKE OVENS AND GAS PRODUCERS

"The first process is well perfected in the beehive and byproduct coke ovens. The products are well known, and means have been developed to utilize commercially the oils and tars produced and to wash the gases of benzol and other motor fuels.

"The second and third processes are less highly developed, but, because they present interesting possibilities, they are attracting great interest among engineers and inventors. Oils from low-temperature distillation processes proved of great value to Germany during the war as a source of motor fuels and lubricants. Much

COKING process gives prime coke, 10,000 cu. ft. of 550-B.t.u. gas and 12 gal. cracked oils and pitch per ton carbonized. Low-temperature distillation provides a substitute for anthracite, also 4,000 cu. ft. of 600 to 800 B.t.u. gas per ton and oils, mostly of the creosote series and paraffins. Complete gasification gives maximum heat content in gas but of low heat value per cubic foot with about 20 gal. of oil and no coke.

interest is also centered on producing a satisfactory anthracite substitute for domestic purposes. The coke from low-temperature processes offers much promise as it is both smokeless, ignites readily and is comparatively free from dust and dirt. The problem in this country has been to find a way to operate this process at a profit. At present, and for some time to come, it is probable that the price of motor fuels, lubricating oils, etc., derived from crude petroleum will be so low that artificial products from coal distillation will be unable to compete with them on a basis that would offer sufficient financial return to make the process pay.

"American chemists have only started to study intensively these products of distillation and have not yet determined what useful substances may be refined from such oils, or the processes by which they may be produced commercially. It is well to remember that whereas coke-oven oils tend

toward the well-known coal tars because the products, to a degree, are cracked in the ovens, the oils from low-temperature distillation tend toward the creosote series and to paraffins. Should the latter process be widely developed, it will be necessary to find a greatly enlarged market for oils of the creosote series. At present prices, it will not pay to attempt to refine paraffin oil from the low-temperature distillation products, although this may be worth while at a later date. The motor fuels derived from washing the gas and distilling the oils are suitable for commercial use and may even now be sold at slightly higher prices than gasoline. The yield of such oils is, however, small with most American coals. It will, therefore, be evident that small commercial returns can be expected at present from the oil products of this process.

"The gas produced has high heating value and would serve satisfactorily for domestic purposes and city distribution. This provides a lucrative market for this product. When high-heat gas is produced, however, heat must be furnished to the retort from some outside source. In certain cases, producer gas has been proposed for this purpose. This lessens the efficiency of the process.

SEMI-COKE MADE TO SUPPLEMENT ANTHRACITE

"Evidently it is to the resultant coke of the low-temperature distillation process that one must look for financial returns to justify the process. The ever-increasing price of anthracite in the East and the increasing smoke nuisance in the Middle West is steadily adding to the commercial possibilities of the process, and it is probable that it will be rapidly developed, its primary object being the substitution of this coke for other domestic fuels.

"The third process has been developed in many forms. The bituminous gas producer, so largely used in the steel industry, and the water gas sets used in making illuminating gas are too well known to require description. The primary object in each case is the complete gasification of the fuel and any tars that may result are generally regarded as unavoidable losses incident to the process.

"The two processes of complete gasification just

mentioned have been made the basis of some of the newer developments. The Mond process, for instance, uses steam in the entering air to keep it down to producer temperature, so that a modified form of low-temperature distillation takes place. Others have gone further and have actually combined low-temperature distillation with the water-gas process as in the Strache system. A plant at Bologna, Italy, built on Strache patents operated satisfactorily for some time on Fairmont, W. Va., coal. These modified processes besides yielding

large volumes of low-temperature distillation oils, also produced gas of higher heating value than that made in producers. Stache claims that the gas has a heating value of 300 to 400 B.t.u. per cubic foot. Later processes of higher efficiency are being developed which combine the Mond process with the low-temperature distillation method, and these later developments appear quite promising.

"In this country the Carbocool process is operated primarily as a low-temperature distillation system to produce substitutes for anthracite. The Piron process, now being developed, apparently has the same object in view. The Bussey process, has the same purpose, namely, the production of a smokeless domestic fuel from soft coal. It achieves this result by allowing a portion of the coke formed to burn to producer gas which in rising through the retort distills off the low-temperature oils. The resultant gas is, therefore, much leaner than that from the two preceding processes.

CAREFUL STUDY GIVEN TO SUBJECT IN BRITAIN

"American engineers are not alone in their interest in low-temperature carbonization methods. The subject is being given close study in Great Britain, where the government has carried out some extensive research work on which reports have been issued from time to time.

"At present the public-utility engineer has little interest in these processes unless he has charge of a gas plant as well as an electrical station. This condition, however, may change rapidly, for there are possibilities in these new processes that may prove of consequence to central-station men. Increasing demand for a smokeless fuel may make it advisable for certain central-station companies to organize subsidiary concerns for the purpose of producing such fuel. The byproduct gas, if of high heat value, may be turned over to the local gas company or sold to manufacturers if of low grade, or it may even be burned under the boilers of the central station. Waste fuels such as coke breeze and dust may be burned efficiently under boilers. Combining the byproduct plant with the central station would lessen coal storage and unloading expense and would afford the gas plant a means of getting rid of waste products.

"A still more interesting possibility is the transmission of fuel from mine to central station by means of gas pipe lines. The increasing freight rates on coal and the improvements being made in the efficiency of several gasification processes raise the question as to the advisability of converting all fuel into gas, oils and ash at the mine mouth transporting only the gas to

the point of consumption. This is a particularly pertinent question where near-by low-grade coals are used as in certain places in the Middle West and where such coals may run 30 per cent or more of total moisture and ash.

GAS SYSTEM AIDS PLANT EFFICIENCY

"It does not seem economic to pay freight on this waste material as well as handling charges on the coal and ash at the central station. Gasification at the mine would relieve the central station of its ash disposal problem. The elimination of coal bunkers, coal preparation and handling equipment, stokers, ash bins and ash-handling equipment, soot blowers, dust catchers, etc., would lessen the investment in the power station, though this might be offset by an investment in reserve gas holders. Power-plant operation would be simplified if gas were employed as fuel, and labor charges would be reduced. No smoke would be produced, which, alone, is a consideration of appreciable value. Furthermore, the use of gas should make higher plant efficiency possible.

"Many factors, therefore, favor this system. All of them would have to be considered as well as the fixed charges and operating costs on the gas plant and pipe lines, together with the commercial value of the oils produced before a correct valuation could be made of this system. This problem will demand the attention of engineers in the near future and hence the importance of following closely all developments in the low-temperature carbonization and complete gasification of coal."

Southern Rhodesia Has Seven Billion Tons Of Good Coal 20 to 46 Ft. Thick

AN ESTIMATE of the coal of economic value in Southern Rhodesia contained in seams of workable thickness, situated within mineable distance from the surface and which is said to be quite conservative is 969,411,000 metric tons, according to H. B. Maufe, in a paper read before the World Power Conference. This statement is based on the 1914 report of the Rhodesian Geological Survey. Subsequent exploratory work, says Mr. Maufe, especially in the Wankie coal fields has shown that the estimate is more than safe. The Wankie main coal has been found to be 28 to 30 ft. thick over a large area, and over a smaller area its thickness is 46 ft. The explored area of the Wankie field is perhaps 300 square miles and if the thickness is estimated at only 20 ft., the reserve of coal may be written in round numbers at 6,434,000,000 long tons. Later exploration in the Sebungwe coal fields permits us to increase the 1914 estimate to 300,000,000 tons. In the Sabi and Tuli coal fields, as no new information has come to hand, the figure remains at 80,000,000 long tons.

DEPOSITS ALMOST EXCLUSIVELY SEMI-BITUMINOUS

Thus the coal resources of Southern Rhodesia may be put at 6,814,000,000 long tons. In the 1914 estimate it was shown that 85 per cent of the coal was semi-bituminous, suitable for steam raising, and the other 15 per cent was in part bituminous and in part semi-anthracite. The more recent additions to the resources have increased the percentage of steam coal which may now be put at 98 per cent of the total resources.

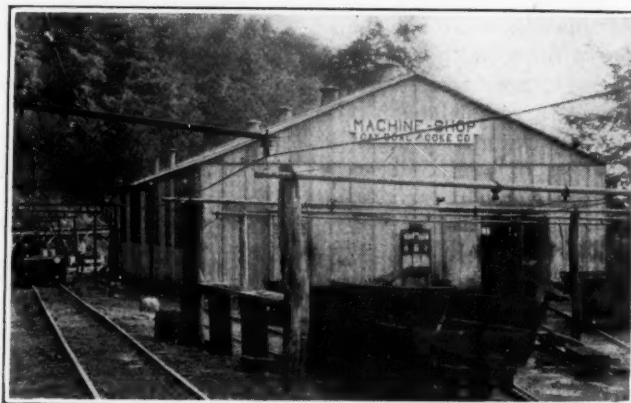
From eighty-eight samples taken from the Wankie

colliery, the only producing coal mine, the following average analysis has been obtained: Moisture, 0.76 per cent; volatile matter, 23.77; fixed carbon, 65.70; ash, 9.77. The British thermal units obtained on combustion number 13,433 and the evaporative power is 13.89 lb. of water per pound of coal. At the New Colliery shaft, two samples gave 14,004 and 13,912 B.t.u., the ash being only 7.02 and 7.75 per cent respectively in these two samples.

Steel Buildings Outlast Those of Wood

SURFACE buildings, fabricated of steel, and made sectional so as to facilitate easy assembly, are coming into favor at many coal mines. Their advantage is not restricted to low first-cost, for they possess other merits of almost equal importance. Mine owners who have erected them in place of buildings constructed of more massive materials assert that the objections raised to lightly-constructed buildings do not apply to the type made entirely of steel.

Fabricated buildings are permanent in the sense that they will outlast any ordinary mine, providing they



A Fabricated Shop in West Virginia

This building is 45 x 75 ft. in plan or plenty large enough to accommodate the electrical and mechanical departments necessary to the production of 1,000 tons of coal per day. Not only can such buildings be erected quickly but if placed on suitable foundations, and kept drained and painted they will last indefinitely.

are amply supported on good foundations, are painted periodically and are properly drained. Such buildings are so well proportioned that drafts are eliminated, there being no wide cracks between adjacent sections. As the superstructure is composed of steel members and the siding is of the same material, fire represents no hazard. Windows and doors can be located wherever they will serve their purpose most effectively. The ultimate salvage value, the portability of the fabricated building, as well as its convenient construction which allows additions to be made at any time without interfering with current operations, are no more striking advantages than the constructional details which enable such a building to be erected in a small fraction of the time required for the building of a brick or other "permanent" structure.

SINCE LONDON'S 4,500,000 people use less generated power than St. Louis' 1,000,000, there is an irresistible chance for the admiring Irish to say the English have strong backs but weak minds.

COAL MEASURES in Congress are often more gaseous than coal measures in the ground.

How to Make Preparations Against a Fire or an Explosion and What to Do When It Occurs

Statistics Based on 164 Disasters of This Kind as Studied by Engineers of
Bureau of Mines—Five Hundred Lives Saved by Fan Reversal
—No Lives Lost by Reversing Fans

BY D. HARRINGTON¹ AND M. W. VON BERNEWITZ²

IN STUDYING the mine-disaster files of the U. S. Bureau of Mines for preparation of a bulletin³ on coal-mine explosions, a table was compiled covering various features of fan installation and the handling of air currents at the time of and after the disasters. As a sidelight on this discussion the loss of life and number of men injured also was tabulated.

Of the 164 disasters tabulated, 143 were explosions, 14 were fires, and 2 involved both fire and explosion. The total loss of life was 4,158 and 412 men were injured. One hundred and forty-five disasters occurred in bituminous-coal mines, 13 in anthracite mines, 2 in lignite mines, 1 in a cannel-coal mine and 3 in metal mines. By states, 35 took place in Pennsylvania, 17 in West Virginia, 16 each in Oklahoma and Alabama, 15 each in Kansas and Illinois, 12 in Indiana, 7 in Colorado, 6 in Kentucky, 3 each in Ohio, Tennessee and Wyoming; 2 each in Arkansas, Montana, Washington, Virginia, New Mexico and Utah and 1 each in Iowa, Missouri, Maryland and California.

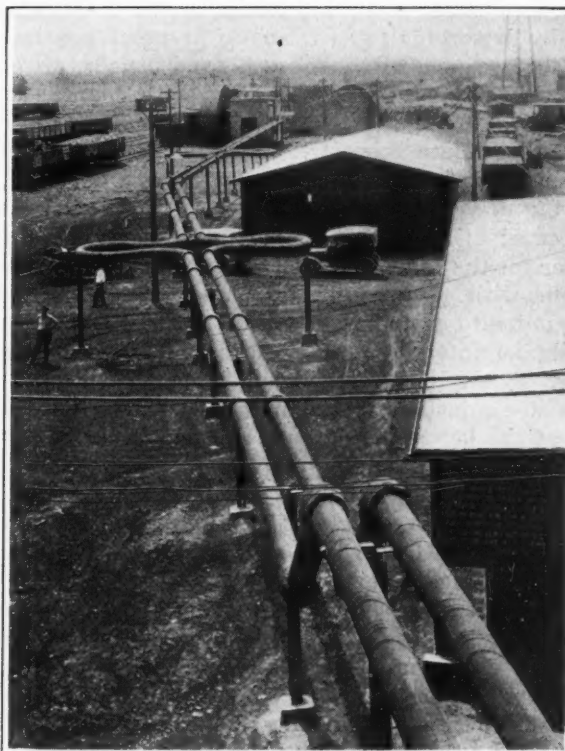
The fans at 47 of the mines were steam-driven, 36 were driven by electricity, 4 by either steam or electricity, 2 by gas and one by either gas or electricity. Information is lacking as to the method of driving the fans at the remaining 75 of the total of 164 mines tabulated. As to the method of ventilating, 103 fans were operated exhausting and 64 were blower or pressure fans. In 42 instances the fans were equipped for quick reversal of the air current in case of necessity and 19 were non-reversible. Information is lacking as to the reversibility of the fans at the remaining mines. Some mines, especially in the anthracite region, have several fans. The capacities of single fans varied up to 350,000 cu.ft. per minute.

LIFE OFTEN SAVED BY REVERSING AIR CURRENT

Immediately following ten of these disasters the air currents were reversed by use of the fan. This in five cases resulted in a saving of life, the number of lives preserved totaling more than 500. In one instance prompt reversal of the air currents by the mine officials after an explosion saved about eighty lives. In another and comparatively recent instance (1924) the direction of the air was promptly reversed by manipulation at the fan at the time of a mine fire, and over twenty lives were saved. In still another case, at the time of a coal-mine fire, through ability to reverse the air currents promptly, numerous lives were saved, and the reversibility of the fan was utilized frequently in fighting the fire. At least once, and probably in two

instances, reversal of the air drew methane over fires and explosions occurred, but without loss of life.

In the above list, which includes most of the major disasters that have occurred in the United States since 1907, there is not a single instance of loss of life having occurred directly or indirectly as the result of reversal



Here Two Fans and Two Steam Lines Guarantee Continuous Ventilation

The photograph from which this picture was made was taken at Zeigler, Ill. Each line has two loops to provide for expansion.

of the direction of air currents by fan manipulation. However, in a number of instances in recent years there has been loss of life due to reversal of air by a fire, there being no fan available to control the direction of the ventilating current. In some instances there undoubtedly has been loss of life because the fan was non-reversible and a reversal of air currents could not be effected without serious loss of time.

An incident at one mine is worth recording, as being a detail worth watching: At the time of the explosion the explosion doors on the fan housing opened and thus saved the fan from injury, but by some means the reversing door was forced halfway over the air duct and remained jammed until it was discovered and moved back.

In at least two cases after the fan was put out of commission by explosions a reserve fan was used. In

¹Formerly mining engineer, U. S. Bureau of Mines.

²Mining and metallurgical engineer, U. S. Bureau of Mines.

³Von Bernewitz, M. W.; Rice, G. S., and Paul, J. W.; Causes of and Lessons from 200 Coal-Mine Explosions, Bull. 237, U. S. Bureau of Mines (in preparation).

at least one instance, also, many lives (probably more than 100) were undoubtedly saved by having a reserve fan ready for use. In one case at the time of a disaster the fan was stopped, and the methane that accumulated came in contact with burning feeders and caused an explosion. In one coal mine an underground fan was driven by a gas engine, and when a fire started the gas tank exploded and thirteen men lost their lives. In another instance in a metal mine a fire started underground at the motor of an electrically driven fan and twenty-one lives were lost. In connection with this latter disaster it may be stated that during recent years many fires in metal mines have been started by electric motors serving underground fan installations, these being chiefly small temporary units for the ventilation of blind ends where tubing is used to carry the air to the face.

HIGH-SPEED ELECTRICALLY DRIVEN FANS FAVORED

Modern practice at coal mines seems to favor electrically driven high-speed fans in fireproof housings on the surface, and although such fans usually are operated exhausting they are equipped with doors, so that, if necessary, the air currents may be quickly reversed. Many up-to-date properties are fitted with a second or auxiliary fan, or at least a second source of power for the fan drive. One successful installation of this kind is located in Alabama. At this plant when the electric power for the fan was cut off by an explosion a kerosene engine with a jaw-clutch attachment to the fan shaft was put into commission within 15 minutes with practically no interruption of air circulation, thus saving many lives. Here an ingenious small-capacity compressed-air installation allowed almost immediate starting of the kerosene engine. Frequently there is much delay and difficulty in starting gas engines that at best are used only occasionally.

Present-day practice at coal mines demands that the fan be installed well out of direct line with the air-course leading to it. It also should be provided with suitable outward opening and easily operated doors in the direct line to allow of quick relief of pressure in case of explosion, thus protecting the fan from the explosive force. The record shows that in at least eight instances the relief doors operated and saved the fans. In two severe explosions during the past few years the fan approach purposely was made of flimsy material, yet kept tight by means of gunite. This

saved the fan by readily collapsing, and mine ventilation in each case was readily restored within an hour by temporary repairs.

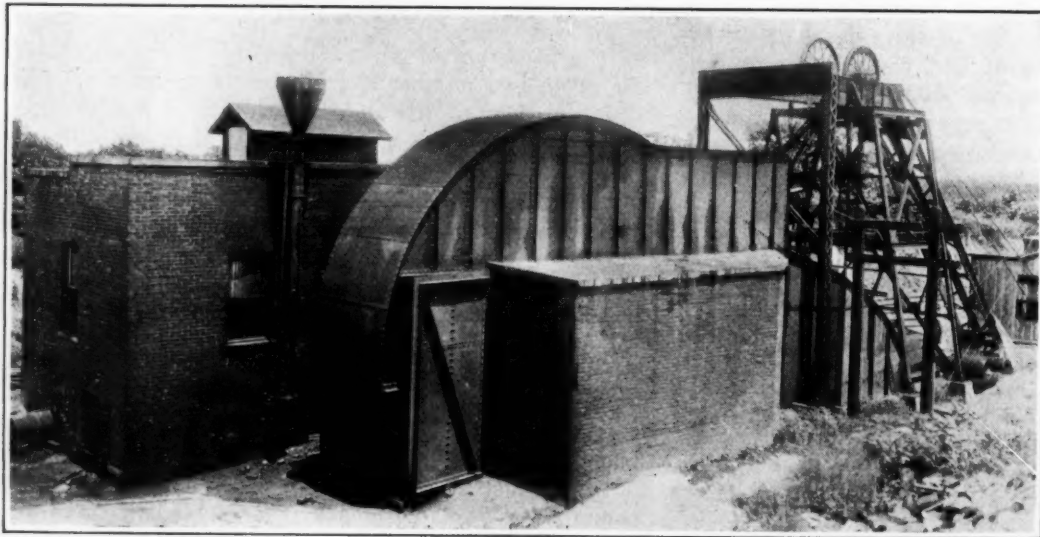
In ventilating installations at metal mines the main fan frequently is placed underground. This is a practice that would not be tolerated in coal mines. It entails positive dangers in metal mines, though undoubtedly it is advisable in some cases. Exhaust fans predominate at coal mines and are fairly common at metal operations. They draw the ventilating current from airshafts, thus making the hoisting shafts downcasts. Pressure fans also are common at metal mines, and there are good reasons for both practices.

EXHAUST FANS PREFERRED AT COAL MINES

At metal mines it frequently is necessary to force back into the surrounding workings heated air or gas issuing from the adjacent strata or from timber. To do this it is advisable to maintain the air in working places under slightly increased pressure. On the other hand, it seems advisable to pull (exhaust) as much as possible of the methane, the principal gas found in coal mines, out of the worked-out or abandoned sections and into the circulating air so as to render it non-explosive. Moreover, it is felt that should the methane in coal mines be forced back into the goaf, or into abandoned sections by pressure ventilation (hence by extra air pressure within the mine), as soon as there is any relief of that pressure, such as might result from a change of barometer or slight or total interruption to air circulation, excessive quantities of gas would be released as a result of the decreased pressure. This would be dangerous. However, some coal mines use pressure ventilation, and some metal mines employ the exhaust system.

In one metal-mining district where many of the principal fans were blowers, causing the main haulage and travelway to be the return aircourse in time of fire, the gases cut off the travelway. Later on, however, the main fans of this district were changed to exhaust units, with intake on the main haulage and travelway.

Though hazardous in any mine, the placing of small fans (boosters) underground to assist in air distribution is dangerous and inefficient in coal operations, yet this is considered good practice in metal mines. In any underground fan installation the adjacent workings should be thoroughly fireproofed, even though the fan is but temporarily in any one position. In coal mines



Fan Installation

At an Illinois mine. To the right is an auxiliary hoist. The curved duct on the right connects the fan-way with the shaft. Arrangements should be made here so that an explosion would open a door or break out a portion of the curved duct so as to save the fan from violence.

At Baker Breaker

Fan installation of the Glen Alden Coal Co., near Scranton, Pa., with an *evase* discharge opening. Modern fan houses are made of permanent construction, for the fans are the lungs of the mine. This is normally an electrically driven fan, but the piping shows that steam power also is provided.



the greatest possible care should be taken against ignition of methane at fans by short-circuiting either after fan stoppage or otherwise. Such ignitions are liable to cause great damage.

There is a diversity of opinion as to what should be done at the fan in time of disaster. As a matter of fact no set rule can be given, except that if damaged by the explosion or fire, the fan should be placed in running order immediately. All mines, whether coal or metal, should have the ventilating system arranged so that the direction of air travel may be controlled at the fan; then in case of necessity the direction of the air currents may be reversed within a few minutes. No change should be made in the usual coursing of air unless available information indicates that advantage may be gained either by stopping the fan or by reversing the air.

Many mining men advocate stopping the fan immediately upon learning of trouble underground. This may be good policy in some instances, but there are others in which it would certainly result in disaster. In the first place, merely stopping the fan does not insure that the air currents will stop, and if it is desired to stop the air flow, other definite steps, such as placing brattices or the opening or closing of doors, are necessary. Moreover, even if the air circulation is stopped at or near the fan, an underground fire quickly establishes its own circulation, and especially if the mine is gaseous there is grave danger of an explosion as the result of a local circulation of methane accumulations (arising from fan stoppage) over fires, ignited gas blowers, etc.

FIRE MAY REVERSE AIR CURRENT DIRECTION

Again, in case of a mine fire the fumes will have been carried through the mine in the usual direction of air flow until the fan is stopped. Frequently upon stoppage of the fan the fire reverses the direction of air movement, and thus fills the remainder of the mine with deadly gases. Reversal of direction of the air at or near the fan will not necessarily cause change of direction of air currents in the interior of the mine, unless provision has been made to hold doors closed, even where pressure against them becomes suction, or *vice versa*. Hence to make air-reversing installations at mine fans effective they should be tested at intervals to determine their probable efficiency in case of emer-

gency, and immediate action should be taken to remedy defects shown by the trial.

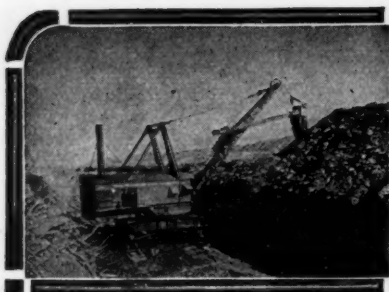
Observations by U. S. Bureau of Mines engineers after disasters indicate that underground workmen are prone in time of disaster to try to follow accustomed travel routes irrespective of their condition as regards falls, gases, etc. Consequently about as good a general practice as can be followed is to try to supply fresh air to the usual travelingways, so far as this can be done by causing the fan to continue to circulate air in them either in the usual or in a reverse direction. In order to accomplish this latter operation it is obviously desirable to have the fan installation of such a nature that reversal may be accomplished with minimum loss of time. On the other hand, it is equally obvious that no change should be made in the usual coursing of the mine air currents except under orders from a responsible mine official who has carefully considered the various phases of the existing conditions.

Bituloid Adversely Discussed at Cardiff

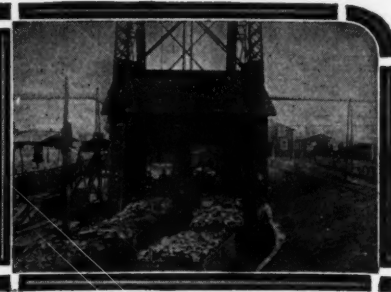
When the South Wales Institute of Engineers met, Oct. 16, at Cardiff to discuss the paper of Prof. Henry Briggs and Norman H. Walls on the use of Bituloid, an emulsion of tar, as a means of allaying dust and preventing mine explosions (a paper that was briefed in the issue of *Coal Age* of Oct. 30), Guy de G. Warren declared that despite the fact that Bituloid had the desirable quality of oozing and so could soak up into new dust when it would fall onto any Bituloided surface, it could not be assumed that this ability to ooze would be maintained indefinitely.

In time the settling dust would no longer adhere and then a dangerous condition would be established, Mr. Warren declared that if, as the authors of the paper stated, a periodic cleaning up was desirable it would be found probably that the men engaged to do the work would long for the incombustible dust, feeling that it was a much easier and pleasanter material to remove from floor, roof and sides than a tacky substance like Bituloided mine dust that stuck to everything it touched.

J. W. Hutchison in expressing his approval of shale dust wanted to know how the authors of the paper proposed to deal with an accumulation of dust and Bituloid on heavy timbers.



News Of the Industry



Central Pennsylvania Operators Again Ask Readjustment of Union Agreement

**Letter to Brophy Says Predicted Prosperity Has Not Materialized—
District's Output Falls Behind Former Years—Increasing
Business Going to Non-Union Fields**

Readjustment of wages and working conditions is asked in a letter sent Nov. 7 by the Association of Bituminous Coal Operators of Central Pennsylvania, with headquarters at Altoona, Pa., to the United Mine Workers, District No. 2. The operators' letter, which was signed by B. M. Clark, president; G. Webb Shillingford, vice-president, and Charles O'Neill, secretary, was addressed to John Brophy, president of District No. 2, but requests an answer from the District Executive Board. The communication, in part, was as follows.

"In the recent past a number of statements were made public by representatives of the coal operators' association, which may be summarized as follows:

"The diminishing coal business in central Pennsylvania is caused partly by the general industrial depression under which all coal operators and other business men suffer, but principally by our unfavorable competitive position due to high cost of production in this district compared with a low cost of production in competitive districts. The high cost of production is due, of course, to the union wage scale, which is much higher than the wage schedules in effect in the non-union sections which are competitive with us.

"Two hundred millions of tons of the coal accessible to the Eastern markets and competitive with our coal is being produced from 50c. to one dollar per ton lower cost than coal can be produced in our district under the union wage scale."

Quote Miners' Statement

"The statement on behalf of the United Mine Workers said in part:

"Coal production has been at the lowest level in years. Consumers are not buying coal. Operators are not able to sell coal at any price because consumers do not want coal and will not buy it until they need it. Coal prices are now down to the lowest point in many years; still there is very little market.

"The reason for the operators' frantic efforts to set aside the present contract is obvious to anyone who cares to look into the matter. They are seeking to bring about a wage reduction when business is poor so that when business improves and they are

able to sell their coal they will make larger profits by reason of the reduction in wages to their employees."

"The joint wage agreements between miners and operators have been continuous since 1899 except during short periods of strike in 1906, 1919 and 1922. In all of this time and in all of these agreements the operators have never had wages reduced during the life of an agreement.

"In 1909 the operators asked for relief and were denied by the Mine Workers upon the ground that the agreement was binding and would not be changed.

"Five times in three years, however, agreements have been changed in favor of the miners to meet conditions as they developed during the period of the life of the agreement. The agreement was not ironclad when increases were being forced from the operators.

Conditions Alarm Operators

"The present situation in central Pennsylvania justifies the grave concern shown by owners of mine properties and the anxiety indicated by the business men and citizens of our communities. For the week ending Oct. 18 the country produced 10,255,000 tons. This is a large tonnage and equal to the average for this period of the year. A few weeks ago we were producing between six and seven millions of tons weekly. The seasonal demand for coal due to approaching winter is here. Your prediction of prosperity to central Pennsylvania has failed to materialize. The increased business has gone to other fields.

"During the five-year period from 1916 to 1920, inclusive, we mined 10.5 per cent of the total, or over 1,000,000 tons per week. To-day we are actually mining about 800,000 tons per week.

"The country has produced from Jan. 1 to Oct. 18, 1924, 363,156,000 tons. Had central Pennsylvania maintained its position it would have produced 38,131,380 tons. Instead we have produced but 30,670,782 tons, or have lost to other fields 7,460,598 tons of our share of the country's business. Of 40,882,000 tons produced in the country for September, our district produced only 3,297,135 tons, or a loss for this month of 995,475 tons. The increase in business is going to the non-union fields.

"We have waited for the return of the 'prosperity' predicted by you. We are now convinced that it is not forthcoming. Due to the winter demand for coal the production in the country has increased to well over 10,000,000 tons per week. The increased tonnage of coal has been produced in the non-union fields rather than in the union fields. Central Pennsylvania's position as a producer of coal remains practically the same today as it was when the country was producing but 7,000,000 tons per week. This loss of production to central Pennsylvania is due to the high cost of production in our district under the present wage scale. Our competitors have a much lower wage scale, hence are securing the business.

Place Blame on Union

"The responsibility for the further strangulation of the coal business rests with your organization. It can be seen in the idle mines, in the desolate towns, and in the migration of hundreds and hundreds of union miners to other industries and non-union fields.

"We speak with frankness and expect action upon your part based upon reason and a desire to co-operate in the successful conduct of the industry. When conditions during the period of an agreement required changing to meet the necessities of your people, the operators of central Pennsylvania have granted you concessions in increased wages. We believe that in relieving such situations upon your requests and upon your demands during a period when you were bound to work for an extended period of time upon a fixed and lower wage scale than we conceded to you during such period, it fixes upon the United Mine Workers a responsibility to recognize the present condition in our industry and to help restore central Pennsylvania to her proper place as a producer of coal.

"We respectfully suggest that this year's business for the union miner and union operator is closed. Coal contracts have been made for the year's business. Spot market winter supply has been provided. Do you want to carry the present year's experience into another year's business of the industry in central Pennsylvania? What suggestions have you to make to relieve the union miner, the union coal operator and the business interests of the communities in which we reside, and to secure their future happiness and prosperity? This communication has been simultaneously submitted to you and the press because of the deep interest the public has manifested in the present condition.

"We respectfully request a reply from your district executive body to this communication."

Speculation on Cabinet Elicits Mention of Lewis As Secretary of Labor

Great interest is being manifested in Washington in the action which President Coolidge may take in connection with the Interior portfolio. This department of the federal government has been much in the limelight during the past two years. Its reorganization along lines which would require legislation has been urged strongly, but the legislation has not been forthcoming. Some are of the opinion that the effectiveness of the department can be increased greatly without legislation through internal reorganization. In that connection the suggestion has been made that this reorganization should be entrusted to Herbert Hoover. It is argued that he has reorganized the Department of Commerce and has it running so smoothly that its direction relatively has become a matter of routine.

Despite all of the speculation which is going the rounds, it is probable that the President is giving little thought to the personnel of the new Cabinet. It is recognized as one of the most disagreeable tasks which a President must perform. It is not unusual for literally hundreds of names to be suggested for each position. Only one can be chosen, which usually results in disappointment and ill-feeling on the part of many of the friends of the others.

In so far as the Interior Department is concerned there is no definite information as to the desire of Dr. Work to continue and no intimation has come from the White House that a change will be made. The name of Frank W. Mondell has been mentioned for this place. He is one of the wheel-horses of the Republican party, but the probabilities are that his conception of conservation would preclude his selection for that post.

An appointment is expected in the near future to fill the vacancy created by the death of Secretary Wallace. President Coolidge departed somewhat from custom when he asked the farm organizations to submit indorsements for the agricultural ministry. As this is written the President has before him thirty names. Each day is expected to see a lengthening of the list.

All agree that Secretaries Hughes, Mellon, Hoover and Stone will be urged to remain in the Cabinet. There is reason to believe, however, that Mr. Hughes and Mr. Stone would like to resume their law practices. The probabilities indicate, however, that their retirement will not come on March 4, although they may not serve out the full four years of the coming term. Secretary Hoover is known to have determined to devote the remainder of his life to public service. It is generally believed in Washington that he will continue in the Cabinet. Secretary Mellon is not the type that is impervious to the flood of attacks of a political and frequently of a demagogic character. Many of the thrusts in his direction got beneath the skin. His tax plan was defeated and many think it



Senator F. M. Sackett

Kentucky elected a real coal man last week as U. S. Senator for the next four years, when Fred M. Sackett, of the Sackett-Speed interests, of Louisville, defeated Senator A. O. Stanley by about 20,000 votes. The Sackett-Speed interests operate three big mines in eastern Kentucky and one in western Kentucky, also the Byrne & Speed Coal Corporation, retailers and jobbers, of Louisville. Mr. Sackett, who is about 55 years of age, was born in Providence, R. I. He studied law and practiced at Columbus, Ohio, Cincinnati, and later at Louisville, where he became president of the Louisville Gas Co., now a part of the Louisville Gas & Electric Co., one of the Bylesby interests. He has served three terms as president of the Louisville Board of Trade.

will be defeated again if it is presented to the new Congress. This, along with the fact that he is not a robust man, is expected to cause him to retire.

There is much talk of John L. Lewis as a possible selection for the secretaryship of labor. Since the Secretary of Labor is the representatives of all labor, union and non-union, some objection might come from workers outside the union as to the ability of Mr. Lewis to be their real friend at court.

Secretary Weeks has done such a good job in the War Department and it is so evident that he is happy in this work that a change in that department is thought to be very unlikely. Secretary Wilbur is the President's own choice. He was induced to leave the bench of the Supreme Court of California to take the navy secretaryship. It is not likely that he will be changed unless a judicial post should open which appeals more to him.

A change of Postmaster General is expected by many.

Third Kanawha Company Signs Union Pact

The Bib Bottom Coal Co., which operates on Campbell's Creek in the Kanawha field of West Virginia, has signed an agreement with the union. The company expects to resume operations immediately. The Bib Bottom company is the third company in the Kanawha field to sign the union agreement since the mines which formerly had been working on a union basis in the Kanawha field closed down on April 1.

Atwater Obtains Control of Mill Creek Company

Wm. C. Atwater, president of Wm. C. Atwater & Co., 1 Broadway, New York City, has confirmed the report that he has acquired the Cooper interests of 60 per cent of the capital stock of the Mill Creek Coal & Coke Co., located at Coopers, McDowell County, W. Va., in the heart of the Pocahontas field. The Mill Creek company has an annual output of a quarter of a million tons. The reported price paid for this interest is \$3,000,000. Mr. Atwater already controls the American Coal Co., the Elkhorn Coal & Coke Co., the Fall River Coal Co. and the Williams Coal Co., all located in the Pocahontas district, and with the purchase of the Mill Creek company he becomes one of the controlling factors in the smokeless fields of West Virginia.

The Mill Creek Coal & Coke Co. is one of the few companies in the Pocahontas field that still makes coke in beehive ovens and there are fifty-five ovens on the property that have burned coke continuously for thirty-six years. This mine was the first mine to ship coal in the West Virginia side of the Pocahontas district. There are eight million tons of coal 9 ft. thick left in the property to be mined out.

Mill Creek mines were opened up by the late John Cooper forty years ago and the first carload of coal was shipped Nov. 4, 1884, the day that Grover Cleveland was first elected President of the United States. Mr. Atwater can well remember Mr. Cooper telling him twenty-five years ago of his shipping the car of coal and then together with the late Jenkin Jones, another old pioneer operator in the Pocahontas district, riding horseback to Princeton, the county seat, to vote and when they called for a Republican ballot found there was none to be had.

Mr. Atwater is president of the Pocahontas Operators Association and is regarded by business associates as one of the most progressive coal operators in the country. He became president of the Mill Creek company on Tuesday.

Fuel Consumption and Power Output by Utilities Up

Electric public utility plants consumed 3,010,901 net tons of coal during September, according to a report by the U. S. Geological Survey. This compares with 3,015,797 tons consumed in August, according to revised figures. Fuel oil consumed by utility plants during September totaled 1,389,780 barrels, compared with 1,498,769 barrels consumed in August. As September was a 30-day month the daily consumption was greater in the latter month, despite the larger totals for August.

The average daily production of electricity by public-utility power plants during September was 160,200,000 kw.-hr., which is almost 5 per cent greater than the daily output during August and 6 per cent greater than for September a year ago.

Inspection Tour of Magnates Deepens Interest in Hard-Coal Merger

Twenty Industrial and Financial Leaders Guests of Hudson and Glen Alden Officials at Marvine and Baker Breakers—Only an Educational Trip, Says Loree

A score of the country's foremost business and industrial leaders, including railroad presidents, bank presidents, captains of industry and financial magnates, all of whom are members of the National Industrial Conference Board, were in Scranton, Pa., last Friday, when they inspected the Baker breaker of the Glen Alden Coal Co. and the Marvine breaker of the Hudson Coal Co., the most modern preparation plants in the anthracite field.

The visit occasioned much comment in view of the reports of a contemplated merger of big coal producing-companies, including the Glen Alden, Erie (Pennsylvania) and Hudson Coal Co. properties. On the surface, however, the visit had no bearing on such a move. It was merely a semi-pleasure and educational trip, or as L. F. Loree, president of the Delaware & Hudson railroad, stated, "A sort of Rotary Club educational trip."

Financial Leaders in the Party

The party included the following: Edward F. Loomis, New York City, president of the Lehigh Valley R.R.; L. F. Loree, New York City, president of the Delaware & Hudson R.R.; J. T. Loree, Albany, N. Y., vice-president of the Delaware & Hudson R.R.; S. D. Warriner, Philadelphia, president of the Lehigh Coal & Navigation Co.; William H. Williams, New York City, vice-president of the Hudson Coal Co.; Walter E. Frew, New York City, president of the Corn Exchange Bank; Loyall A. Osborne, New York City, president of the Westinghouse International Electric Co.; Herman H. Westinghouse, New York City, chairman of the Westinghouse Air Brake Co.; George M. Verity, Middletown, Ohio, president of the American Rolling Mill Co.; Guy E. Tripp, New York City, chairman of the Westinghouse Electric & Mfg. Co.; William H. Nichols, New York City, chairman of the Allied Chemical & Dye Corporation; William H. Nichols, Jr., New York City, president of the General Chemical Co.; Herbert F. Perkins, Chicago, Ill., first vice-president of the International Harvester Co.; Herbert H. Rice, Detroit, Mich., president of the Cadillac Motor Car Co.; Dr. John J. Moorhead, New York City, professor of surgery, Post-Graduate Medical School and Hospital; A. H. Harris, New York City, chairman finance committee and vice-president of the New York Central R.R.; John Henry Hammond, New York City, of Brown Brothers & Co.; Archibald R. Graustein, New York City, president of the International Paper Co.; Frederick A. Geier, Cincinnati, Ohio, president of the Cincinnati Milling Machine Co.; Thomas E. Donnelley, Chicago, Ill., president, R. R. Donnelley & Sons Co.; Philip T. Dodge, New York City, chairman, International Paper Co.; William Butterworth, Moline, Ill., president

Deere & Co.; W. L. Clause, Pittsburgh, Pa., chairman of the Pittsburgh Plate Glass Co.; Ernest R. Behrend, Erie, Pa., president of the Hammermill Paper Co.; and Magnus W. Alexander, New York City, managing director, National Industrial Conference Board.

The visitors were the guests of A. M. Fine, vice-president of the Hudson Coal Co., and W. W. Inglis, president of the Glen Alden Coal Co.; who were assisted by H. M. Warren, electrical engineer, and S. D. Dimmick, vice-president and general manager, of the Glen Alden Co., and R. F. Buchanan, general manager of the Hudson company.

Both breakers were especially prepared for the reception of the magnates, placards explaining the use and capacity of each distinct piece of machinery. The tour of inspection started at the Marvine shaft and after the visitors had seen the freshly mined coal dumped on a conveyor line they followed the fuel through all stages of preparation. The conveyor, a 48-in. rubber belt, in two endless sections, each 550 ft. long, moved with its load at the rate of 300 ft. a minute to the top of the breaker. The belt carries 1,800 tons of coal a day. The visitors then followed the course of the coal from the top of the breaker through the chutes, jigs, shakers and separators into the coal pockets. The cleanliness of the surroundings elicited much comment.

Gasoline Price Dependent On Coal, Says Teagle

Gasoline prices will be regulated by the market price for coal, according to Walter C. Teagle, president of the Standard Oil Co. of New Jersey, in a statement made public at Tulsa, Okla., recently. He based his prediction on an analysis of the petroleum situation by the company.

Under existing conditions gasoline can be obtained from fuel oil in many instances at a cost lower than it can be obtained from crude petroleum, Mr. Teagle said. "Fuel oil is sold in direct competition with coal," he said. "The reserves of coal are greater and more certain than reserves of petroleum and the price of coal so affects the price of fuel oil that gasoline is affected in proportion."

"Whenever gasoline can be obtained from fuel oil at a cost lower than the natural gasoline in the crude the tendency will be toward a reduction in the available quantity of fuel oil and an increase in the available amount of gasoline. A contraction in the supply of fuel oil will tend to enhance its value, whereas an increase in the quantity of gasoline will have the reverse tendency."

"When there is an overproduction of crude it is necessary for the industry to sell petroleum in the form of fuel oil in competition with coal and the consumers of gasoline will participate in the lower value so established."

Coal-Mine Fatalities, 1920-22, by Countries*

Country	Per 1,000 persons employed			Deaths Per 1,000,000 gross tons of coal raised		
	1920	1921	1922	1920	1921	1922
British Empire						
United Kingdom.....	0.88	0.66‡	0.95†	4.81	4.63	4.43‡
Union of S. Africa.....						
Transvaal.....	2.37	1.42	1.98	5.07	3.43	4.66
Cape.....						
Orange Free State.....	4.35	4.08	4.27	10.60	10.13	10.89
Natal.....	2.71	2.07	3.41	9.26	7.99	11.89
Union.....	2.65	1.87	2.81	6.79	5.41	7.91
Canada						
Nova Scotia.....	2.30	2.36	1.55	4.57	5.40	4.09
Alberta.....	2.99	2.10	4.10	4.20	3.54	6.56
British Columbia.....	2.68	1.45	4.67	6.30	3.89	12.01
India 	0.98	1.35	1.13	10.07	13.99	11.50
Australia						
New South Wales.....	1.00	0.89	0.55	1.86	1.75	1.18
Victoria.....	0.50	2.51		1.65	8.42	
Queensland.....	0.85	29.20	2.05	1.80	80.65	5.22
W. Australia.....		1.15	1.34		2.13	2.28
Tasmania.....						
Commonwealth.....	0.91	3.78	0.67	1.77	7.90	1.46
New Zealand.....	0.24	2.29	1.32	0.54	5.53	3.23
Foreign Countries						
Austria.....	0.94	1.47	0.99	8.00	12.43	7.79
Belgium.....	1.13	0.89	0.93	8.22	6.82	6.80
France†.....	0.97	0.93	**	8.09	7.19	**
Germany.....						
Prussia.....	2.20	**	**	8.46	**	**
Saxony.....	1.43	2.53	**	6.43	11.05	**
Greece.....	0.87	0.57	**	10.29	6.03	**
Italy.....	1.07	0.89	1.30	12.27	12.45	11.82
Netherlands.....	1.08	1.21	1.03	4.98	7.79	5.75
Spain.....	1.69	1.32	1.33	19.74	14.06	13.86
Algeria.....			**			**
United States						
Actual.....	2.89	2.41	2.32 }	3.86	4.39	4.80
Reduced to 300-day basis.....	3.78	4.19	** }			
Chile.....	2.61	1.80	1.69	32.50	23.11	23.64

*From the Mineral Industry of the British Empire and Foreign Countries—Statistics, 1920-1922 (Coal, Coke and Byproducts), published by the Imperial Mineral Resources Bureau. †When adjustment is made for stoppage of work, rate = 0.88. ‡Great Britain only. §Year ended September 30. ||Mines under Indian Mines Act only. ¶Excluding Saar. **Information not available.

Blue Diamond Coal Co. Buys Old First Creek Mine

The first progress the Jewett, Bigelow & Brooks receivers have made in the disposal of any of the eight coal mining companies held in the group of that defunct concern was the sale on Nov. 6 of the old mine of the First Creek Mining Co. in the Hazard district to the Blue Diamond Coal Co., of Knoxville, Tenn., for \$100,000. The public sales in four localities the previous week at which the various properties were put on the block resulted in nothing. Few bids were offered and these were so low that the receivers got permission from Judge Cochran in the federal court at Covington, Ky., Nov. 6 to reject them all. An offer had been made of \$43,000 on the First Creek mine and \$27,500 for the Black Joe mine, in the same region.

The Hazard Jellicoe Coal Co. mine, the third of the J. B. B. mines of the Hazard field, is likely to revert to the Harvey Coal Co. This company is expected to lease it to some operating company soon in case no sale is completed. It is the largest J. B. B. mine in the Hazard field and it was announced that no bids for it under \$380,000 would be considered at the public sale. No bids for it were made at the time.

The public sales also failed to dispose of the J. B. Elkhorn Coal Co. and the J. B. Elkhorn Land Co., in the Elkhorn field; the Harlan Fox Coal Co., in the Harlan field, and the three Bell County properties, which are the J. B. Straight Creek Mining Co., the Roth Coal Co. and the Jaybee Jellicoe Coal Co.

More Hot Shot for Union In West Kentucky

Some more hot shot have been fired into the remnant of organization of the United Mine Workers which is keeping a small part of western Kentucky tied up by strike. More public correspondence between District Attorney W. O. Smith, a former district president, and Wes Ames, the incumbent, has been released. Smith is trying to get Ames to sign an agreement with operators at a reduced scale in order to save the union from destruction. Ames asserts that Smith is disloyal to unionism but Smith invites attention to Ames' illogical position in part thus:

"Probably the miners of this coal field are not acquainted with the fact that you and practically every one of the principal officers of your district organization during the joint conference in Louisville in the month of April openly and strongly advocated a reduction in wages as being the only hope and salvation of your district organization.

"No doubt the miners of this coal field are not aware of the fact that you and your district secretary-treasurer and a number of other officers went to Indianapolis with the avowed purpose of asking the international officers to permit you to make a contract with the coal operators of this district carrying with it a 20 per cent reduction in wages.

"I am sure they do not know that

Brotherhood Mines Now Running Non-Union

Although Warren S. Stone, head of the Coal River Collieries Co., which is the Brotherhood of Railroad Engineers' coal company, with four mines in West Virginia and Kentucky, told John L. Lewis, president of the United Mine Workers, that he did not want to run non-union, he is now doing so. The recent refusal of the miners' union to permit a cut in wages so that the railroad union could run its mines has driven Stone to action. He couldn't let his mines stay down forever. Mines Nos. 1 and 2, on Lick Creek, are still idle, but Mines Nos. 3 and 4, on Laurel Fork, are both operating non-union on the 1917 scale. The brotherhood company has evicted a number of union non-working miners and their families from company houses, which naturally wins much sweet and friendly comment from the miners' union.

after the St. Bernard Mining Co. had withdrawn from that conference and declared its intention no longer to deal with the United Mine Workers, you, Herman Vincent and ex-president Lonnie Jackson tentatively agreed among yourselves to ask Frank Rash, an officer of the St. Bernard Mining Co., to come back into the conference and agree again to treat with your organization upon the condition that you would agree to a 20 per cent reduction in wages, and that you were so indifferent and unconcerned at that critical period in your wage negotiations that after Mr. Rash had agreed to come back you let the golden opportunity to save and perpetuate your organization in the Hopkins County coal field slip by, refusing to carry out the suggested agreement with Mr. Rash."

Smith points out cases of suffering among western Kentucky miners and their families—wives pawning their wedding rings, miners selling \$75 milk cows for \$10, children barefoot in the frosty air, and men in the union begging—all because of bullheadedness on the part of union officials.

New Haven R.R. Seeks Bids

J. F. Manning, fuel agent for the New York, New Haven & Hartford R.R., will receive bids until noon on Nov. 17 for delivering alongside the discharging plant at South Boston, Mass., between 360,000 and 410,000 net tons of high-volatile run-of-mine bituminous coal, in substantially equal monthly quantities between May 1, 1925, and May 1, 1926.

Coal traffic west bound through the canals at Sault Ste. Marie during October, according to the monthly report of the Corps of Engineers, U. S. Army, consisted of 1,643,308 net tons of bituminous and 57,850 net tons of anthracite. Of this, 8,733 tons of soft coal passed through the Canadian canal, the remainder going by way of the American canal.

Grand Jury in Utah Indicts Promoters of Great Western Coal Co.

A mild sensation was caused at Salt Lake City, Utah, last week when it became known that the federal Grand Jury had indicted George A. Storrs, former warden of the State Prison and a leader in political and financial circles of the state, together with Joseph S. Welch, Earl J. Welch and Charles M. Croft on a charge of conspiring to defraud and with using the mails for that purpose in connection with their promotion of the Great Western Coal Mines Co.

The company recently became a mutual and was one of the best known of the many recent coal mining concerns to attempt to enter the field on the mutual plan. Among the witnesses called before the grand jury were members of the State Securities Commission, which had at different times authorized the company to sell stocks and bonds in the state. The Secretary of State and the Attorney General also were called. Each defendant has been released on a \$1,000 bond and the case is expected to come up for trial at an early date.

The indictments are based on charges that securities of the Great Western Coal Mines Co. were sold by misrepresenting the assets and intentions of the company. In support of the charges letters and documents were presented in an effort to show that money raised from prospective stockholders and bondholders was actually diverted, in whole or in part, to the payment of personal obligations of the individuals indicted. It is said the indictment terminated an investigation of nearly two years on the part of federal agents.

It is alleged that the men were taking money from the public for the development of assets which did not exist. It is stated in the charge that they never owned more than nine acres of coal land in the Gordon Creek region of Carbon County, where the property was situated, or in any other place.

Thomas Yates, secretary of the company, said the indictment will have no effect on the present organization of the company, and refers only to the pre-organization sales campaign. He sets forth a list of the property owned by concern and said they would be actually shipping coal this month.

The indictment appears to be against the officials and not an attack on the company as a business unit. H. C. Hicks, secretary to the securities commission, told a *Coal Age* correspondent. Mr. Hicks said the company was not originally classed as a mutual but its last application to sell stock, which was refused, would have placed it on a mutual basis.

Mr. Storrs, president of the company, is a former superintendent of the Spring Canyon Coal Co. and a former Sheriff of Carbon County. Storrs, the well known coal camp in Carbon County, was named in his honor. The Welch's also are well known in Western coal mining circles.

Coal Producers Jubilant at Outcome Of Presidential Election

Glad to Escape Democratic Regulation and Nationalization Theories of La Follette—Remedy for Overproduction Hoped For—Removal of Uncertainty on Trade Association Activities Expected

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Producers of coal are more than pleased by the outcome of the presidential election—they are jubilant. Ordinarily there are more Democrats among coal operators than among those in charge of many manufacturing industries, because none of them is influenced by the need of protective tariffs for his product. In this particular campaign, however, there were unusual reasons why coal operators gave their support to the Republican ticket, despite the fact that the Democratic standard bearer had served the industry in an important way in a legal capacity.

The resolutions committee at the Democratic National Convention allowed itself to be influenced by New England—a section which has much to say in convention but which furnishes the party no electoral votes—to insert in the platform a pledge “to regulate by governmental agencies the anthracite coal industry and all other corporations controlling the necessities of life.” While bituminous coal was not mentioned specifically, it was recognized that it is a necessity of life and was included in the platform declaration just as surely as if it had been mentioned specifically. As a matter of fact, all coal was included in the paragraph until Harry L. Gandy, secretary of the National Coal Association, persuaded Senator Walsh of Massachusetts that there could be no more justification for the mention of bituminous coal than any other commodity necessary to life.

Demand for Individual Initiative

While that paragraph in the Democratic platform was enough to lose to the party all support from the coal industry, the principal reason for the general support given the Republican ticket was the vigorous stand of the party against the nationalization theories of Senator La Follette. As a matter of fact the best political analysts agree that the chief reason for the Republican landslide was the determination of the American people to stay “on the road of individual initiative, enterprise and opportunity along which American institutions so far have progressed,” to use Secretary Hoover’s phrasing.

As in Great Britain, the American public, in view of the Russian experiment, was glad to have an opportunity to demonstrate conclusively that it has no intention of turning into the road “which leads through nationalization of utilities to the ultimate absorption into government of all industry and of all labor.” Full advantage was taken of the opportunity to crush any tendency to put more government in business.

The election of the Republican ticket is regarded as the answer to the plea of the coal industry to be let alone, recently so effectively voiced by S. Pem-

berton Hutchinson, president of the National Coal Association, in his speech before the American Mining Congress. The danger of regulatory legislation has been swept away by the proved popularity of the Republican position on this major point.

No Government Meddling

There is another important promise to the coal industry in the re-election of the Republican administration. It is preparing to take a definite step to free the oil industry of the great evil of overproduction. The interest which the coal industry has in that constructive effort has been pointed out previously in this correspondence. If it is in the public interest to stop overproduction in oil it would be in the public interest to encourage some plan which would prevent it in coal. While the details of the plan have not been announced, it is safe to say that the party will be consistent with the attitude it assumed during the campaign and not inject government meddling into business on the excuse of curtailing overproduction. In fact, it is known definitely that the plan as it refers to petroleum contemplates only sympathetic co-operation in a movement which will be directed by the industry itself.

Because of the way in which the people have spoken and because of the well established policies of the administration, the coal industry has little reason to anticipate regulatory legislation. There is going to be no attempt to shackle business with new restrictions. The administration’s policy is clearly revealed as being one looking to the fostering of business growth by allowing it the utmost freedom. For that reason it is logical to suppose that it will hasten to remove the uncertainty hanging over trade association activities. Of great importance to business in general is the fact that the two vacancies about to occur through the resignation of justices of the Supreme Court will be filled by a President who is certain to name to that all-important body men of proved conservatism and soundness.

Apparently the new administration is going to have enough backing in each house of Congress to carry through its legislative program. This augurs well for the coal industry and other industries, which will be benefited by a program of constructive legislation which will include tax reduction. Even in the matter of foreign relations definite progress may be expected. With the passing from the scene of the leaders in the League of Nations controversy bitterness is disappearing and a policy probably will be adopted which will be in the interest of world stability. The nomination of General Dawes as the Vice-Presidential candidate meant that

Three-Cylinder Engine For Coal Service

The Louisville & Nashville R.R., Louisville, has just received a new three-cylinder type of locomotive, the first of its kind south of the Ohio and the fourth in the United States, made by the American Locomotive Co., which is testing out this new type of locomotive, which is said to have a considerably increased drawbar tractive power or pull, due to the third cylinder keeping heavy loads pulling steadily, without the intermission in power, as is the case with the two-cylinder locomotive, especially in hilly country. The new engine weighs 334,000 lb. exclusive of tender, and will be used between Corbin, Ky., and Louisville, in bringing up heavy coal and freight trains from southeastern Kentucky.

the Republican Party at that time had underwritten the Dawes plan. To the signature of the Republican Party now has been added the signature of the American people. Moral backing, as well as financial support, now is pledged to this particular project for the restoration of Europe. Instability abroad for five years has militated against the stability of business in this country. The Dawes plan promises prompt relief from that situation. As a result of all of this planning by business becomes possible as has not been the case for a decade.

Farley Succeeds Bermingham As D. L. & W. Coal Head

Announcement on Nov. 6 that John F. Bermingham had resigned as president of the Delaware, Lackawanna & Western Coal Co. had been discounted considerably by rumors during the past several weeks that such action was contemplated. Recently Mr. Bermingham had resigned as a director of the Lackawanna Railroad Co. Mr. Bermingham’s successor as president is Elliot Farley, of Boston.

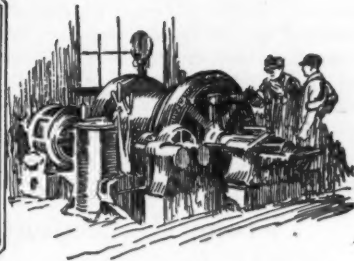
Mr. Bermingham became president of the coal company several years ago, having been promoted to that position from general auditor. He is one of the best known and best informed coal men in the industry. During the World War he took a prominent part in the distribution of coal and served on several federal state and city committees.

Mr. Bermingham resides at Oyster Bay, Long Island, where he takes a prominent part in civic affairs. He is a director of the Coal & Iron National Bank, New York City; trustee, Dime Savings Bank, Brooklyn; director, North Shore Bank of Oyster Bay, and a director of the State Bank of Sea Cliff, Long Island. He also is an honorary Deputy Police Commissioner of New York City. A brother, L. V. Bermingham, is secretary of the St. George Coal Co., of New York City.

Mr. Farley has taken charge at the New York office but declined to make a statement regarding his plans or policy.



Practical Pointers For Electrical And Mechanical Men



Why Waste Money to Place Electric Wires In Underground Conduits?

Overhead Wire Installation Around Mine Is More Economical—Appearance Afforded by Underground Wiring Not Important Consideration—Conduits Above Ground Eliminate Trouble

In the smaller cities where pole lines are used in the business section and where a large number of wires may enter a building, we can readily see why they are placed in underground conduits. Imagine the situation if all wires were carried overhead direct from the crossarm to the most convenient points of entrance through the outside walls! But around a mine, where sometimes no more than two or three wires enter a building from a nearby pole, why do we so often see the conduit brought down the pole, then underground and up through the floor to the switch cabinet or busbars?

This type of installation usually costs much more than the overhead; it is not so reliable and is always more difficult to repair. Generally the only advantage of an underground entrance is that it affords a neater appearance. However, it seems rather inconsistent to sacrifice other more important advantages for appearance alone, especially when we consider that the overhead entrance is still the approved method for city dwellings where neatness is a more important consideration than at the small substation, tippie, fan, or hoist-house of the average mine.

Fig. 1 is a sketch of an actual substation installation. The transformers

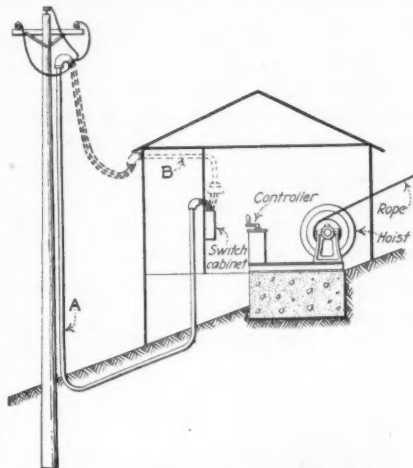


Fig. 2—Conduit from Pole Line

The expense of an underground wiring entrance to this hoisthouse, of cheap frame construction, appears out of place. Had the line been carried overhead it would have been much easier to install it.

are located outside the building in a fenced enclosure, and the 2,200-volt line is brought to a point above the buses through the rigid iron conduit A. A simple, cheap and more reliable method is shown by the dotted position B.

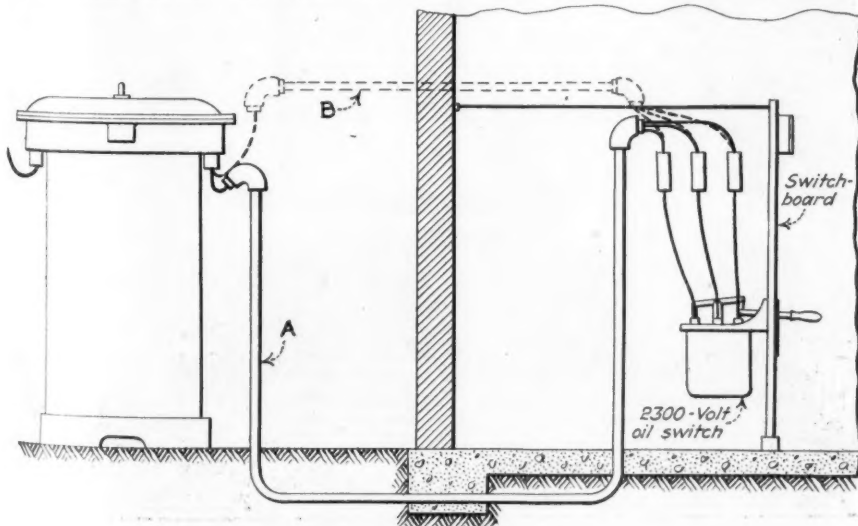


Fig. 1—Conduit Encases Wires from Transformers

The transformers supplying 2,300 volts to this substation are located outside and only a few feet from the building. There would have been no disadvantage in an overhead entrance.

Referring to Fig. 2, we see a sketch of another actual installation. Here an underground conduit is used to bring power into a cheap frame building which houses a small hoist. Fifty feet of 2½-in. conduit, indicated by A, is used. Method B would have required only 8 ft. of conduit and would have saved approximately 120 ft. of wire. Placing the conduit overhead would eliminate the risk of trouble from water which is always liable to enter an underground conduit through poor joints, by holes caused by corrosion or by terminal fittings which are not weatherproof.

Coil Springs Used as Belts in Graphic Wattmeters

By making a few simple changes to the mechanism of their switchboard-mounted, graphic type, alternating-current wattmeters, R. F. Demi, chief electrician of the Keystone Coal & Coke Co., of Greensburg, Pa., is eliminating those aggravating troubles which formerly were the frequent causes of incomplete or imperfect demand-meter charts.

The meters are of the type in which a small motor, controlled by relay contacts, is used to move the inking pen. One such meter is installed in the main line at each operation. The continuous charts thus obtained are used to guide and stimulate the efforts of the organization toward holding down the 15-min. maximum demand which is an important factor affecting the power bills.

The common troubles encountered were the slipping of the flat leather belt driving the chart re-roll, to the climbing of sprockets by the chain connecting the motor to the pen mechanism, and the opening of circuits in the resistance units.

Both the chart re-roll and pen mechanisms were changed to belt drives using small coil springs as belts. This method, as compared to a leather belt, has the distinct advantage of maintaining a definite tension unaffected by use, time or climatic changes. New grooved pulleys for the re-roll were made in the local shop, but for the pen drive the old sprockets were altered to accommodate the coil-spring belt. This was done in a lathe by turning the teeth nearly off and then cutting a groove in the face. The belts were made by winding fine spring-steel wire on a mandrel about ¼ in. in diameter.

The compact and rather inaccessible resistance units furnished with the meters were made up of short resist-

ance tubes of graduated size nested one inside the other. To eliminate the difficulties of repairing or replacing these resistance units they were replaced by a group of individual units each screwed into a socket so as to be easily removed for testing or renewal.

May Easily Damage Meters by Wrong Connections

Portable direct-current millivoltmeters and ammeters are often damaged because many users do not realize the circumstances which cause a burn-out. The necessary practice at the mines of grounding one side of the direct-current line forms a condition which should in itself spell "Caution" to the electrician using shunt-type instruments on mine circuits.

Fig. 1 is schematic diagram of an ammeter and its shunt, connected for

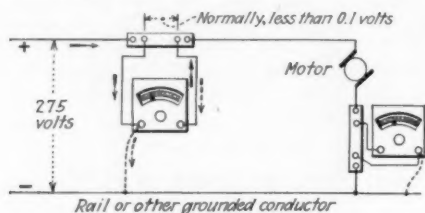


Fig. 1—Lead Drops to Ground

Accidental connection of ammeter leads to ground frequently makes it necessary to send instruments back to the factory for repair.

testing the motor of a mine pump or other inside equipment. The natural tendency is to connect the shunt in the positive conductor as shown by the fine lines. With this arrangement, contact to ground by the shunt and of either instrument lead, will instantly burn the meter winding. This is liable to happen when the meter is being connected or disconnected, or it may be caused by a lead knocked loose from the shunt. The fine dotted line indicates how 275 volts may be thrown on

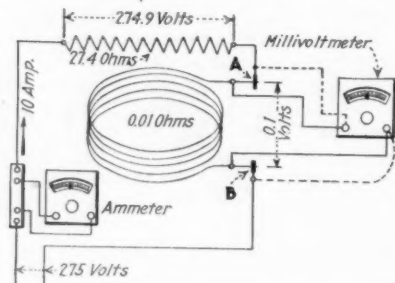


Fig. 2—Millivoltmeter Connection

Loosening of temporary connections made for resistance measurement has been the cause of damage to many low-reading voltmeters. Meter connections should be made independent of, and on the inside, of main connections A and B.

a 0.1-volt capacity instrument by the positive lead touching a rail.

The preferred method of connecting the meter into the negative circuit is shown by the heavy lines of Fig. 1. When this arrangement is used there is practically no chance of the meter being damaged by accidental connection of either of the shunt leads to the ground.

The use of a millivoltmeter or of any low-reading voltmeter for determining the voltage drop across a low-resistance conductor, which has been connected temporarily into a circuit, has many times resulted in damage to the meter. Fig. 2 shows the connection when determining the resistance of a series field coil. If the millivoltmeter leads are connected as in full lines no damage to the instrument will result should the connections A or B (generally rather temporary for such a test) come loose; however if connected as shown by the dotted lines the meter will be burned out. Under the latter condition practically full line voltage is applied to the low-capacity meter.

Welding Galvanized Iron

The arc of an electrode is so stable that, with it, it is easy to weld galvanized iron. The most of the work to be done with this material consists in making butt welds or edge welds on thin plates, these welds constituting the seams in plates, pipes, etc. Welds are made with a single bead along the seam. The automatic welding machine, which affords great economies, is well fitted for work of this kind. Although hand welding is also employed to advantage, the methods used should be

Plate Thickness in In.	Electrode Diam. in In.	Current Approx. in Amp.	Speed in. per Minute
1/8	1/16	70-80	40
1/8	1/16	95-105	24
1/8	1/16	125-135	20
1/8	1/16	155-165	12
1/8	1/16	180-190	10

as nearly as practicable those about to be described below for automatic welding practice.

1. For seam welding, either butt or edge, the edges to be welded should be brought together closely and clamped and held in that position. For butt welding on thin metal, the edges should be clamped against a copper backing strip, to prevent burning through the

metal and to give a smooth seam on the underside of the work.

2. The electrode should be vertical to the work, or point slightly forward in the direction of travel.

3. Suitable sizes of electrode, values of current and speeds of travel along the seam are given in the accompanying table. The speeds are much higher than for ordinary welding. Those given in the table are conservative. Faster speeds may be used in many cases. The speed and the current used in all cases must be adapted to each other, more current being used with higher speed. With too little current for a given speed, slips will occur in the weld, whereas if the current is too great holes will be produced in the seam. The arc voltage recommended is from 14 to 16 volts, depending on the thickness of the work.

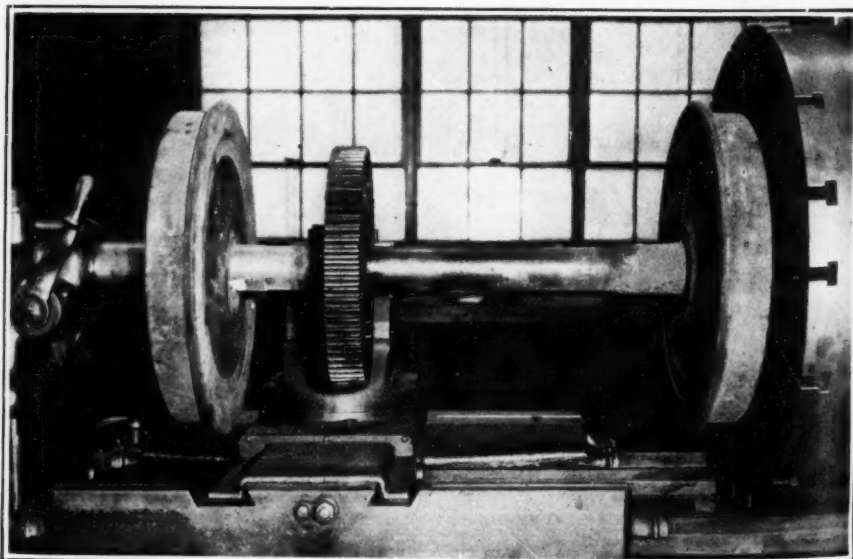
By a little practice with this kind of welding it is possible to train the operator to weld materials which now are being thrown away. Old parts may be built up and machined to size.

Repairing Locomotives Axles

In spite of careful attention given to the lubricating of locomotive journals, the axles under hard service eventually wear. One of the many jobs that are facilitated by a large lathe, which makes the purchase of this machine a good investment, is the repairing of these worn axles.

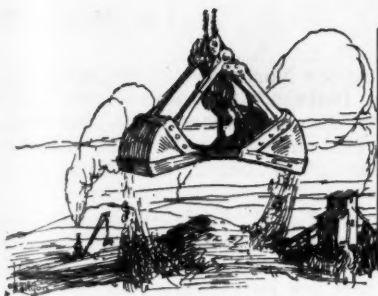
Without taking off the wheels and driving gear, the worn journal bearing surface can be built up with an electric welder and then turned down in the manner shown in the accompanying illustration.

If worn axles are not repaired as described, they must be replaced. The latter job involves no little expense for, aside from the cost of the new axles, much time must be spent in changing and adjusting the spur-gear and wheels. Furthermore, the practice is not recommended because tight and true press fits of the wheels on the axles are not easily made.

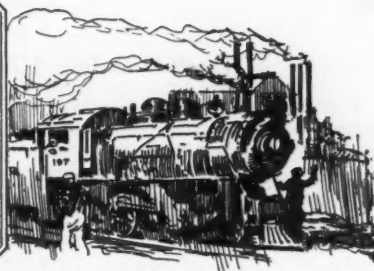


Saving Money by Welding and Turning Worn Axles

It is a simple matter to build out a worn surface on the axle of a mine locomotive and later turn it down on a lathe. If the wheels are pressed off and on an axle whenever a repair must be made the wheels soon become loose.



Production And the Market



Halting Tendency Still Pervades Coal Business But Sentiment Is Better

A touch of cold weather in the Middle West last week was all that saved the coal trade from a further general decline, for in practically every other section of the country the demand fell far behind expectations. This was especially marked in Eastern markets and in Ohio, and to a less notable degree in Kentucky, where there is sufficient business in hand to keep the mines going for a while. The undertone is less firm in New England too, despite the fact that there has been a gradual pickup in the textile industry. As usual, the election is blamed in many quarters for the halt in business, though the result had been sized up fairly generally long ago. The consensus is that the outcome will benefit the trade, but insufficient time has elapsed as yet for the observance of any substantial effect. The impending close of navigation on the lakes is a conflicting element that is puzzling the trade, as it will throw such a large tonnage on other markets that the problem of absorbing it may be too difficult for solution. In that event some mines may be forced to close down until they are able to find an outlet for their product.

General Business Impetus Promised

Business in general is expected to show renewed impetus from now on, according to most authorities, including the Federal Reserve Board, which reports increased production in most lines. Even those in which the gains have not been so marked show healthy conditions, the board states.

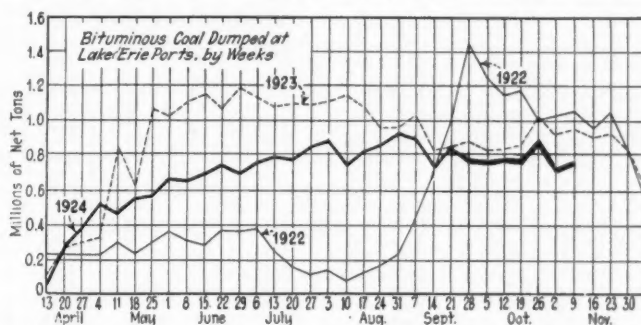
Coal Age Index of spot prices of bituminous coal receded another point last week, standing on Nov. 10 at 170, the corresponding price for which is \$2.06, compared with 171 and \$2.07 respectively on Nov. 3.

There was a further reaction in activity at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Nov. 6 totaling 325,568 net tons, compared with 363,818 tons the week before.

A slight increase in movement up the lakes took place,

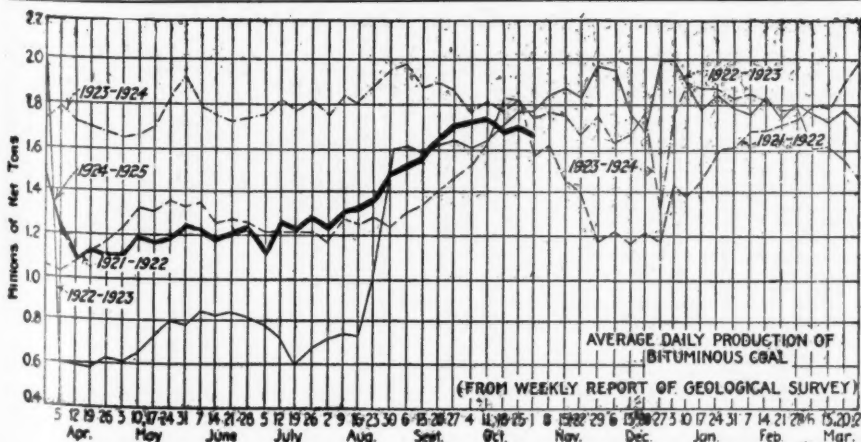
dumpings at Lake Erie ports during the week ended Nov. 9, according to the Ore & Coal Exchange, being as follows: For cargo, 704,538 net tons; for fuel, 30,937 tons, compared with 688,548 and 38,272 tons respectively during the previous week.

Bituminous coal production receded during the week ended Nov. 1, when, according to the Geological Survey, 10,091,000 net tons was produced, compared with 10,300,000 tons during the preceding week, as shown by revised figures. The reduction was due to the partial observance of All Saints' Day as a holiday. In like manner, anthracite output fell away to 1,444,000 net tons, compared with 1,927,000 tons during the week ended Oct. 25. The comparatively larger loss in output



of hard coal was due to the general observance of Mitchell Day (Oct. 29) in addition to the church holiday.

Mild weather is proving a stumbling block to the anthracite trade, demand being slow and independent prices showing a tendency to weaken. With output curtailed, however, the movement has been strong enough to prevent accumulations. Dealers are well supplied with most sizes. Stove leads in demand and nut moves without much difficulty, but pea is in trouble. Rice and barley are the strongest of the steam sizes, buckwheat No. 1 being comparatively weak.



Estimates of Production

(Net Tons)

BITUMINOUS

	1923	1924
Oct. 18.....	10,694,000	10,261,000
Oct. 25 (a).....	10,919,000	10,300,000
Nov. 1 (b).....	10,547,000	10,091,000
Daily average.....	1,758,000	1,682,000
Cal. yr. to date.....	464,825,000	383,553,000
Daily av. to date.....	1,798,000	1,480,000

ANTHRACITE

Oct. 18.....	1,978,000	1,750,000
Oct. 25.....	2,001,000	1,927,000
Nov. 1.....	1,328,000	1,444,000
Cal. yr. to date.....	78,821,000	76,134,000

COKE

Oct. 25.....	276,000	140,000
Nov. 1 (b).....	266,000	150,000
Cal. yr. to date (c)...	15,874,000	8,161,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.

Cool Weather Hits Midwest

The prayed-for cold wave rolled across the Midwest states late last week with a slight stimulation of domestic business, which had been pretty dull for the previous two weeks. However, the weather sharps were not sure the cold would remain long. Not all the domestic coal standing unbilled at mines was moved, but running picked up a trifle during the first two days of cold in anticipation of business. This, of course, slightly increased the output of screenings and did not, therefore, stiffen steam business.

The screenings situation in Illinois and Indiana is not particularly discouraging this week, however. The slowing down of mines lately due to inability to sell lump and egg has reduced the supply. On top of this a good many big buyers have been signing up steam contracts for the rest of the winter. Thus screenings in southern Illinois have been enabled to stand up closely to the circular of \$1.25@ \$1.50, central Illinois has quit selling dollar coal, Indiana Fifth Vein has stepped up to above \$1 and Indiana Fourth Vein is holding its own at \$1.40@ \$1.50.

The election had almost no immediate effect on the coal trade although the wise observers expect a steady but slow improvement in industrial business from now forward. The Midwest region is more directly affected by weather and freight rates than by voting. The new weather is encouraging but the reduction in rates on eastern Kentucky and

other inner crescent coal to the Northwest is distinctly discouraging to Illinois and Indiana. Southern Illinois only recently was hurt by the 28c. rate increase to the Twin Cities, thus giving dock coal an edge over most Midwest output; and now comes the I. C. C. order reducing L. & N. coal 15c. to the Northwest.

Coal business has slumped off at St. Louis. Warm weather had stocked up the yards and there is very little demand except for a little high grade. There is a further increase in the number of homes that are not buying coal this year, and a survey by some dealers shows that oil-burner competition is growing. This also is affecting the mines, and yet the mines and the dealers are not spending any money to retain the business that they had. Wagonload steam has eased off. Carload steam is slow locally and there is no demand from the country. Country domestic has also fallen off.

Little Change in Kentucky

Kentucky prices continue fairly steady over the week, no material change being reported in anything. Demand has not been as active as had been expected, but there is enough business in hand to keep mines going for a while.

Southern coal is moving north freely. During October all previous records were smashed on the Louisville & Eastern division of the Louisville & Nashville R.R. out of the

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
Market	Quoted	Nov. 12	Oct. 27	Nov. 3	Nov. 10	Market	Quoted	Nov. 12	Oct. 27
		1923	1924	1924	1924†			1923	1924
Smokeless lump.....	Columbus...	\$5.10	\$4.50	\$4.35	\$4.25@ \$4.50	Franklin, Ill. lump.....	Chicago.....	\$4.10	\$3.35
Smokeless mine run.....	Columbus...	2.35	2.35	2.25	1.90@ 2.25	Franklin, Ill. mine run.....	Chicago.....	2.60	2.35
Smokeless screenings.....	Columbus...	1.35	1.30	1.30	1.25@ 1.45	Franklin, Ill. screenings.....	Chicago.....	1.45	1.35
Smokeless lump.....	Chicago...	5.10	4.60	4.60	4.50@ 4.75	Central, Ill. lump.....	Chicago.....	3.10	2.85
Smokeless mine run.....	Chicago...	2.25	2.00	1.85	1.75@ 2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.20
Smokeless lump.....	Cincinnati...	5.50	4.25	4.10	3.75@ 4.00	Central, Ill. screenings.....	Chicago.....	1.05	1.15
Smokeless mine run.....	Cincinnati...	2.35	2.25	2.00	1.85@ 2.00	Ind. 4th Vein lump.....	Chicago.....	3.35	3.10
Smokeless screenings.....	Cincinnati...	1.50	1.15	1.15	1.10@ 1.25	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35
*Smokeless mine run.....	Boston.....	4.30	4.45	4.45	4.25@ 4.40	Ind. 4th Vein screenings.....	Chicago.....	1.20	1.30
Clearfield mine run.....	Boston.....	2.15	2.00	1.85	1.65@ 2.25	Ind. 5th Vein lump.....	Chicago.....	2.50	2.85
Cambria mine run.....	Boston.....	2.55	2.40	2.20	2.10@ 2.75	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10
Somerset mine run.....	Boston.....	2.35	2.15	2.05	1.85@ 2.50	Ind. 5th Vein screenings.....	Chicago.....	.80	.95
Pool 1 (Navy Standard).....	New York.....	3.00	2.75	2.75	2.50@ 3.00	Mt. Olive lump.....	St. Louis.....	3.10	2.85
Pool 1 (Navy Standard).....	Philadelphia...	3.00	2.70	2.70	2.50@ 2.90	Mt. Olive mine run.....	St. Louis.....	2.25	2.50
Pool 1 (Navy Standard).....	Baltimore.....	2.25	2.10	2.10	2.00@ 2.25	Mt. Olive screenings.....	St. Louis.....	1.00	1.35
Pool 9 (Super. Low Vol.).....	New York.....	2.25	2.10	2.10	2.00@ 2.25	Standard lump.....	St. Louis.....	3.05	2.85
Pool 9 (Super. Low Vol.).....	Philadelphia...	2.30	2.15	2.15	1.95@ 2.35	Standard mine run.....	St. Louis.....	2.05	2.20
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.05	1.90	1.80	1.65@ 1.80	Standard screenings.....	St. Louis.....	.55	.80
Pool 10 (H.Gr. Low Vol.).....	New York.....	2.00	1.90	1.90	1.75@ 2.00	West Ky. lump.....	Louisville.....	3.00	3.10
Pool 10 (H.Gr. Low Vol.).....	Philadelphia...	1.85	1.75	1.75	1.65@ 1.90	West Ky. mine run.....	Louisville.....	1.65	1.65
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	1.90	1.70	1.65	1.60@ 1.65	West Ky. screenings.....	Louisville.....	.60	.65
Pool 11 (Low Vol.).....	New York.....	1.75	1.60	1.65	1.60@ 1.75	West Ky. lump.....	Chicago.....	2.85	2.75
Pool 11 (Low Vol.).....	Philadelphia...	1.60	1.45	1.45	1.35@ 1.60	West Ky. mine run.....	Chicago.....	1.75	1.65
Pool 11 (Low Vol.).....	Baltimore.....	1.80	1.60	1.55	1.40@ 1.60				

High-Volatile, Eastern					South and Southwest				
Pool	Market	Nov. 12	Oct. 27	Nov. 3	Pool	Market	Nov. 12	Oct. 27	Nov. 3
		1923	1924	1924			1923	1924	1924
Pool 54-64 (Gas and St.)...	New York...	1.60	1.55	1.50	1.40@ 1.60	Big Seam lump.....	Birmingham..	3.85	3.10
Pool 54-64 (Gas and St.)...	Philadelphia...	1.60	1.50	1.50	1.40@ 1.60	Big Seam mine run.....	Birmingham..	1.95	1.60
Pool 54-64 (Gas and St.)...	Baltimore...	1.70	1.50	1.45	1.40@ 1.60	Big Seam (washed).....	Birmingham..	2.35	1.85
Pittsburgh ac'd gas.....	Pittsburgh...	2.55	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....	3.25	2.85
Pittsburgh gas mine run.....	Pittsburgh...	2.25	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....	2.25	1.60
Pittsburgh mine run (St.)...	Pittsburgh...	1.90	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Louisville...	3.50	3.25
Pittsburgh slack (Gas).....	Pittsburgh...	1.05	1.20	1.20	1.10@ 1.25	S. E. Ky. mine run.....	Louisville...	1.85	1.60
Kanawha lump.....	Columbus...	3.00	2.55	2.55	2.35@ 2.75	S. E. Ky. screenings.....	Louisville...	.75	.85
Kanawha mine run.....	Columbus...	1.85	1.50	1.55	1.40@ 1.75	S. E. Ky. lump.....	Cincinnati...	3.00	3.10
Kanawha screenings.....	Columbus...	.65	1.00	.95	.90@ 1.10	S. E. Ky. mine run.....	Cincinnati...	1.50	1.55
W. Va. lump.....	Cincinnati...	3.10	3.00	2.85	2.50@ 2.75	S. E. Ky. screenings.....	Cincinnati...	.85	1.00
W. Va. gas mine run.....	Cincinnati...	1.50	1.55	1.55	1.40@ 1.60	S. E. Ky. mine run.....	Cincinnati...	1.50	1.55
W. Va. steam mine run.....	Cincinnati...	1.50	1.45	1.45	1.25@ 1.35	S. E. Ky. screenings.....	Cincinnati...	.85	1.00
W. Va. screenings.....	Cincinnati...	.80	.95	.90	.90@ 1.00	Kansas lump.....	Kansas City..	5.10	5.00
Hocking lump.....	Columbus...	2.90	2.55	2.55	2.40@ 2.75	Kansas mine run.....	Kansas City..	3.50	3.10
Hocking mine run.....	Columbus...	1.85	1.55	1.60	1.50@ 1.70	Kansas screenings.....	Kansas City..	2.25	2.00
Hocking screenings.....	Columbus...	.70	.90	.75	.65@ .85				
Pitts. No. 8 lump.....	Cleveland...	2.55	2.40	2.40	1.90@ 2.85				
Pitts. No. 8 mine run.....	Cleveland...	1.90	1.85	1.85	1.75@ 1.80				
Pitts. No. 8 screenings.....	Cleveland...	1.00	1.00	1.00	1.00@ 1.05				

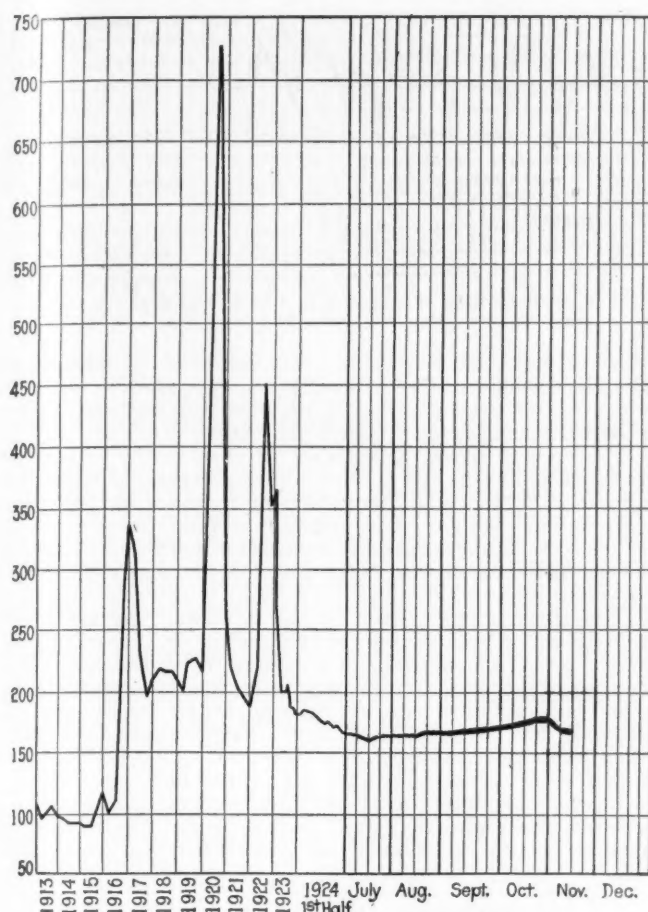
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advance over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Nov. 12, 1923		Nov. 3, 1924		Nov. 10, 1924†	
Broken.....	Market Quoted	Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$9.60@ \$10.50	\$8.00@ \$9.25	\$9.00@ \$9.75	\$8.00@ \$9.25	\$8.00@ \$9.25	\$8.00@ \$9.25
Egg.....	Philadelphia...	9.85@ 12.25	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25	9.45@ 9.75	8.75@ 9.25
Egg.....	New York.....	9.85@ 12.25	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25	9.45@ 9.75	8.75@ 9.25
Egg.....	Philadelphia...	9.60@ 12.50	8.00@ 8.35	8.17@ 8.27	8.14@ 8.20	8.17@ 8.25	8.14@ 8.20
Stove.....	Chicago*.....	9.85@ 12.25	8.75@ 9.25	10.00@ 10.25	8.75@ 9.50	9.75@ 10.50	8.75@ 9.50
Stove.....	New York.....	9.85@ 12.25	8.90@ 9.25	9.85@ 10.25	9.15@ 9.50	10.10@ 10.75	9.15@ 9.50
Stove.....	Philadelphia...	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut.....	Chicago*.....	9.85@ 12.25	8.75@ 9.25	9.50@ 10.25	8.75@ 9.25	9.75@ 10.00	8.75@ 9.25
Chestnut.....	New York.....	9.85@ 12.25	8.90@ 9.25	9.65@ 10.00	9.15@ 9.25	9.85@ 10.50	9.15@ 9.25
Chestnut.....	Philadelphia...	9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea.....	Chicago*.....	6.75@ 8.25	6.15@ 6.65	5.00@ 5.50	5.50@ 6.00	5.00@ 5.50	5.50@ 6.00
Pea.....	New York.....	6.75@ 8.25	6.35@ 6.60	5.75@ 6.35	5.75@ 6.00	6.75@ 6.00	6.00
Pea.....	Philadelphia...	6.00@ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	Chicago*.....	2.00@ 3.00	3.50	2.25@ 2.75	3.00@ 3.15	2.50@ 3.00	3.00@ 3.15
Buckwheat No. 1.....	New York.....	2.25@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	Philadelphia...	1.50@ 2.00	2.50	1.80@ 2.15	2.00@ 2.25	1.75@ 2.25	2.00@ 2.25
Rice.....	New York.....	1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	Philadelphia...	1.00@ 1.25	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	New York.....	1.00@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	Philadelphia...	1.45	1.60	1.35@ 1.60	1.60	1.35@ 1.60	1.60

* Net tons, f.o.b. mines. † Advance over previous week shown in heavy type, declines in italics.



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Nov. 10	Nov. 3	Oct. 27	Nov. 12
Weighted average price.....	170	171	176	184
	\$2.06	\$2.07	\$2.12	\$2.23

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

Hazard and Elkhorn districts, while the total coal car loadings for the entire system were smashed during October, the road having handled heavy tonnage from all fields.

Prices are \$3@3.25 for best block in both eastern and western Kentucky, with some eastern quoted at as high as \$3.50, but without much new business booked at over \$3.25. Screenings in western Kentucky are a shade firmer at 65@75c. a ton, while eastern starts at 85c. and goes to \$1, with just a little tonnage quoted at \$1.05@1.10.

Mine run has been moving very slowly in view of the fact that screenings are in good supply, and at low prices. Even nut sizes are low as a result of considerable screening of nut, western Kentucky quoting small nut as low as \$1.60, with big nut at \$2.10, and eastern Kentucky, producing nut in only a very few mines, is quoting \$1.75@2. Western Kentucky is asking \$2.50@2.75 on egg and \$2.75@3 on lump, while eastern is asking \$2.25@2.50 on egg, and \$2.25@2.75 on lump.

Northwest Feels Better

A feeling of distinct optimism pervades the coal trade circles at the Head-of-the-Lakes as a result of the presidential election. Dealers are looking forward to an improving demand for steam and gas coal to set in almost immediately from industrial quarters. Colder weather during the last ten days also is contributing to good inquiry from retailers over the Northwest, who are at present carrying limited supplies. A feature on the market was the speeding up of inquiry for Pocahontas prepared. That led to another advance of 50c. to \$8.50 as compared with \$7 early last month.

Receipts at Duluth and Superior docks during October

aggregated 1,196,833 tons, including 1,151,086 of bituminous and 45,748 of anthracite. That brought receipts of bituminous as of Nov. 1 to 6,362,663 tons and of anthracite 1,177,271 tons. Top figures for the year were set in shipments from the docks over the Northwest during October, the aggregate being reported at 26,418 cars as compared with 24,373 cars during September and 23,436 cars during October last year.

Coal is coming to the Milwaukee docks quite freely, but demand is faint. After a slight flurry due to an ominous drop in temperature the flow of orders waned with the recovery of the mercury. Dealers say everything depends upon the weather, which has been unseasonably warm. October receipts of coal by lake—cargo and car ferry—were larger than the receipts of any other month in 1924. Cargo totaled 120,640 tons of anthracite and 423,064 tons of bituminous coal, or 543,704 tons in all. Cargo totals for the season to Nov. 5 are 693,294 tons of anthracite and 2,130,474 tons of bituminous coal, or 2,823,768 tons in all, as against 813,824 tons of anthracite and 2,741,963 tons of bituminous coal—3,555,787 tons in all—during the same period in 1923.

At the Twin Cities September and October consumption was only one-fourth of the usual moderate volume that is burned in those months. The deliveries from the docks this fall to this region as compared with last show a loss of 25 per cent. Despite this depressed circumstance, the market position of practically all grades of coals, except screenings, is firm. Dock prices are holding to their list as they have been doing. All-rail coal is firm at the ruling prices, and there seems to be little surplus coal seeking an outlet. Dock prices remain the same as they have been for some time.

West Needs Cold Too

Continued warm weather has brought the domestic market in the Southwest almost to the vanishing point. A considerable surplus of prepared grades has accumulated at Kansas and Oklahoma mines, although these operations are now averaging only about half time. The curtailment of production has resulted in cleaning up the surplus of screenings. Industrial demand is constant.

Continued warmth throughout the Colorado territory has shown its effect upon the coal business. This is the first time in twenty-two years that Colorado has experienced an October without a snow. Production last week showed a slight pick-up, however, and Colorado mines worked an average of 32 hours. The "no market" hazard is slowly being overcome, as only 20 per cent of the total working time lost was due to this cause. Prices are unchanged.

In Utah the unseasonable weather is reducing production. Working time is not over 50 per cent. Prices remain firm, both wholesale and retail, except that retailers are beginning to cut the price of slack. Industries other than the metals are buying very little coal.

Ohio Business Sags Some More

Gorged markets to the north in conjunction with balmy weather has caused a further break in prices at Cincinnati, only slack holding its own, urgent buying by lake interests for the last run of the boats north before the close of navigation causing it to advance slightly. Even mine run, which has been only casually affected by the recent upward trend, was forced to back water a little. The domestic sizes have been badly shot. J. A. Morris' figures show that 13,345 cars loaded with coal passed through the gateways last week, only a few cars less than record figures.

Domestic demand at Columbus has turned dull as a result of warm weather. Buying is limited strictly to immediate wants. Retail prices have been rather firm up to a few days ago, when some cutting was reported. Steam trade is rather quiet, as reserves are still sufficient and purchasers are loath to increase them. Demurrage coal is selling on the open market at low prices. Industrial conditions are still unsettled. Lake trade is about over for the season, which is expected to throw a large tonnage of West Virginia screenings on the market which is now going to the lakes. The output in Ohio fields has shown a decline.

Business in the Cleveland market is slower for this time of the year than in many years. Demand is low and run-of-mine prices have softened 10 to 15c. per ton; some odd lots of distress coal from other districts than No. 8 Ohio have sold for even less. Mild weather continues to hold down the domestic trade and steam consumption seems to

be at a minimum, buyers apparently not caring to lay in any sizable quantities.

Prices at Pittsburgh Withstand Pressure

Demand at Pittsburgh continues dull. There has been no shipping of coal on consignment to any appreciable extent, and thus there has been no "distress" coal, but there is a possibility that consigning of coal will be resorted to. There is no accumulation of loaded coal at mines threatened at present with demurrage. Prices are unchanged.

Demand continues light at Buffalo, as compared with the supply, which means a trade without not much in it for the seller or anybody else but the consumer. Some sanguine people believe that the low point has been passed, but it is too soon to say what the election will do. Price quotations have not changed to amount to anything for months; they are still weak. Competition from West Virginia and Kentucky coals continues. The lake trade is dull and apparently about closed for the season. Shipments to November are 2,380,150 tons compared with 2,485,020 tons to the same time last season.

New England Market Less Firm

In New England there is less indication of firmness than a week ago. The sales agencies seem again to have overreached slightly as to price, and coal has been purchased at from 5@10c. less during the current week. The trade is being made to realize there is as yet nothing in the industrial situation to warrant predictions of more than gradual improvement during the winter months.

At Hampton Roads small accumulations are again heard from. However, output is on a better scale, and it is simply that there are fewer buying orders in the market. Purchases are more spasmodic, and those who felt a fortnight ago like running to cover are now inclined to test the trend of prices and buy only on favorable openings. As usual in such situations there have been cancellations to upset the calculations of producers, and where late in October the latter felt like putting brakes on sales they are inclined now to make small concessions in the interest of a higher average output. Spot cargoes range \$4.25@4.40 per gross ton, f.o.b. vessel for Navy acceptable grades. For prepared coal moving west there appears to be a stable demand.

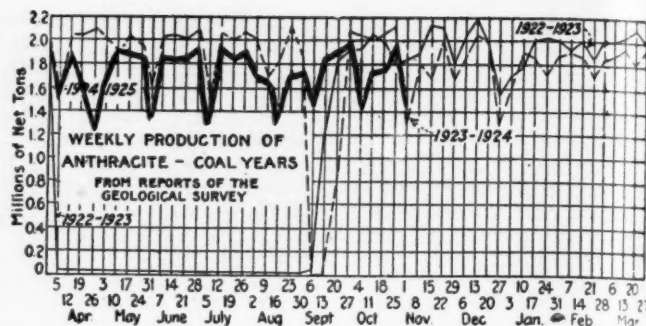
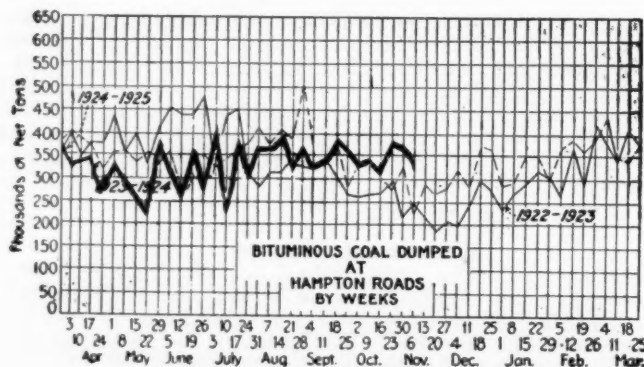
On cars Boston for inland delivery the volume of coal handled has somewhat decreased lately, although prices are reasonably strong at \$5.40@5.50 per gross ton. At Providence and at Portland competition is less acute and factors are able to obtain a more remunerative gross price.

On coals from central Pennsylvania all-rail there is practically nothing more than the staple business for special uses that materializes every year regardless of competition from Southern coals at tidewater. Prices show no material change.

Atlantic Seaboard Markets Inactive

There is scarcely any activity in the New York market. Buyers show no anxiety when warned of a possible car shortage or transportation difficulties. Shipments to tide-water passed the 2,000-car mark one day last week, but tonnage did not accumulate. While most of the arrivals were either on contract or on order there was sufficient free coal to meet all demands and to keep the market unsettled.

The boom that was expected after election is slow to materialize at Philadelphia. Mild weather continues to be



a deterrent, but buying by the railroads is improving. Regular commercial contracts also are productive of good business, for prices are better than for spot business. Spot prices hang at the same low level. Most mines are still on a 50 per cent basis, with plenty of them doing less work.

At Baltimore no life is shown in any branch of the steam or gas coal trade, but improvement is hoped for with the passing of election. The spurt of a few weeks ago was short lived and prices have gone back to the late summer level. The first week of November saw no export clearances of coal.

The Birmingham steam market is on the upgrade. The movement of spot coal is showing some increase week by week as additional business is taken on by the mines and contract customers are taking more liberal consignments. This is especially true of the railroads, which have increased their weekly quotas around 10 per cent over what they have been taking for weeks past. The seasonal demand from oil mills, compresses, gins and saw mills is providing an outlet for a good tonnage in the aggregate, and the hydro-electric companies are using a great deal of coal at their steam plants and will continue to do so until the drought is broken.

Anthracite Demand Disappoints

Slow demand and lower prices for independent coals prevailed in the New York anthracite market during the last week, as weather conditions were not conducive to heavy coal burning. Movement, however, was heavy enough to prevent an accumulation of coal. Retailers have full bins of most sizes and add to their supplies only when assured of receiving a pro rata share of stove, which continues to lead the demand. Egg is giving the most trouble of the larger sizes. Chestnut moves fairly easily. The poorer grades of pea coal can hardly be moved even though quoted about 50c. less than the better coals. Demand for this size is extremely slow. Buckwheat No. 1 is the weakest of the steam coals; rice and barley are in better demand.

Because of the October shortage due to the flood, shippers have plenty of orders, but retail trade at Philadelphia is only moderate. The retail price situation is stronger since the independents have increased mines prices for November. The most wanted size among dealers continues to be stove, although more nut is being sold at retail. Steam coals are in better demand. Independents are moving nearly all of their production without price cuts.

Anthracite dealers at Baltimore have been looking askance at the growth of oil-burning equipment, due to the cost of domestic sizes of anthracite. The new equipment recently put on the market to consume buckwheat coal in the ordinary home is being watched with interest.

Trade has improved a little at Buffalo. There has been so much unseasonably warm weather that the consumer has had nothing to do but burn a little gas. All he wanted was stove and chestnut and of course if he was able to buy only furnace sizes he was distressed and refused to buy at all. The coke trade is still quiet.

Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Car
Week ended Oct. 25, 1924.....	1,112,345	193,736
Previous week.....	1,102,336	191,449
Week ended Oct. 27, 1923.....	1,073,841	195,458
	Surplus Cars	
	All Cars	Coal Cars
Oct. 22, 1924.....	94,153	46,476
Oct. 14, 1924.....	99,952	50,160
Oct. 22, 1923.....	23,895	5,674
	Car Shortage	
	13,655	3,250

Foreign Market And Export News

Slight Upturn in British Coal Market; Output Above 5,000,000 Tons

Though the South Wales market is still in an unsatisfactory state, a gradual improvement is discernible. Interest has been revived in steam coals by the announcement that some important contracts for supplies over the next twelve months have been booked. Fewer price concessions are being made. Coal stocks are large, except the best smalls, which are scarce.

The Newcastle market is somewhat steadier though business is still very poor. Inquiry for current shipment has improved and some of the collieries are negotiating for November output. There are no contracts to report though two European gas works have taken 3,000 tons of gas coals for delivery next month.

Production by British collieries during the week ended Oct. 25, a cable to *Coal Age* states, was 5,061,000 tons, according to the official reports. This compares with 5,147,000 tons produced during the week ended Oct. 18.

French House Coals Active; Industrial Inquiry Dull

The general position of the French coal market is unchanged. Inquiry for industrial fuels is dull, but for house coals there is more activity, due to seasonal requirements. Stocks are not large and prices are firmly maintained.

The Nord and Pas-de-Calais are now trying to make up for the delays in shipments during September.

Imports of British coals, which fell off during the week ended Oct. 17 to 125,000 tons, increased the following week to 181,500 tons from South Wales alone. Prices are steadily falling at the shipping docks, and in spite of sterling being maintained at 86f. the margin between British and French prices (delivered) has lessened to the point of being rather dangerous in certain regions where British and French fuels enter into competition.

The shortage of rolling stock in France is less pronounced.

The M.I.C.U.M. ceased to function in the Rhenish-Westphalian Basin on Oct. 28. An organization to regulate the importation of German coals hereafter is under consideration. It probably will be controlled by the state and administered by representatives of French collieries, importers, merchants and leading consumers. At a recent meeting held at the Ministry of Public Works no agreement could be reached owing to divergence of views regarding the transport of coal by the Rhine.

During the first eighteen days of October, France and Luxemburg received 287,700 tons of coal; 213,700 tons of coke, and 21,600 tons of lignite briquets, a total of 522,600 tons. The daily average of 29,000 tons compares with 31,600 in September.

Between Oct. 23 and 29 the O.R.C.A. was supplied with 24,250 tons of coke through Ehrang and 31,215 tons through Aix-la-Chapelle, a total of 55,465 tons or scarcely 8,000 tons a day.

Hampton Roads Outlook Bright; Prices Hold Their Own

Business at Hampton Roads showed very little change, with prices holding their own and with prospects for better movement growing brighter. Coastwise business has been fair, bunkering good, and foreign shipments tend downward.

Prices reflect somewhat increased shipments to tidewater, and a number of inquiries from New England have had the effect of putting a more hopeful tone in the market. Domestic business is somewhat better in the retail trade, and optimism is the keynote of the situation.

Shippers have much faith in the effect of the presidential election on general coal movement, whether the effect is actual or imaginary.

U. S. Fuel Exports During September

(In Gross Tons)

	1923	1924
Anthracite.....	175,689	327,322
Bituminous.....	1,768,620	1,502,829
Exported to:		
France.....	36,990	27,067
Italy.....	37,135	33,590
Netherlands.....	29,655	
Other Europe.....	10,281	1,100
Canada.....	1,513,923	1,201,280
Panama.....		23,700
Mexico.....	4,876	5,803
British West Indies.....	4,103	20,184
Cuba.....	47,382	46,184
Other West Indies.....	17,833	17,011
Argentina.....	11,630	15,660
Brazil.....	38,106	77,282
Chile.....	848	781
Egypt.....		3,366
French Africa.....	6,384	7,606
Other countries.....	9,474	22,215
Coke.....	95,479	41,804

U. S. Fuel Imports During September

(In Gross Tons)

	1923	1924
Anthracite.....	8,695	7,777
Bituminous.....	50,321	22,782
From:		
Canada.....	46,729	14,492
Japan.....	90	7,540
Australia.....	3,500	750
Other countries.....	2	
Coke.....	1,374	3,511

Export Clearances, Week Ended Nov. 8, 1924

FROM HAMPTON ROADS

	Tons
For Brazil	
Braz. Str. Barbacena for Pernambuco.....	5,437
For Canada	
Fr. Str. Sierentz for Montreal.....	6,604
Br. Schr. Gerbeville for Halifax.....	2,760
For Canal Zone	
Amer. Str. Ulysses for Cristobal.....	12,024
For West Indies	
Br. Str. Goathland for Puerto Plata.....	5,642

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Oct. 30	Nov. 6
Cars on hand.....	947	1,215
Tons on hand.....	60,376	74,356
Tons dumped for week.....	123,808	96,083
Tonnage waiting.....	5,000	12,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,434	1,731
Tons on hand.....	98,950	123,250
Tons dumped for week.....	98,183	108,842
Tonnage waiting.....	18,455	10,909
C. & O. Piers, Newport News:		
Cars on hand.....	1,734	1,950
Tons on hand.....	98,041	101,355
Tons dumped for week.....	102,847	87,547
Tonnage waiting.....	2,195	8,810

Pier and Bunker Prices, Gross Tons

PIERS

	Nov. 1	Nov. 8†
Pool 9, New York...	\$4.75@ \$5.00	\$4.75@ \$5.00
Pool 10, New York...	4.65@ 4.80	4.65@ 4.80
Pool 11, New York...	4.40@ 4.55	4.40@ 4.55
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia...	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.30	4.25
Pool 2, Hamp. Roads	4.15	4.15
Pools 5-6-7 Hamp. Rds.	4.00	4.00

BUNKERS

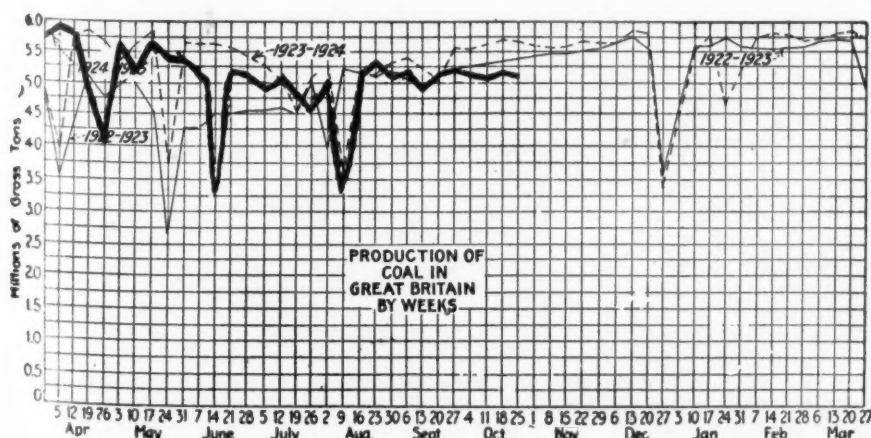
Pool 9, New York...	\$5.00@ \$5.25	\$5.00@ \$5.25
Pool 10, New York...	4.90@ 5.05	4.90@ 5.05
Pool 11, New York...	4.65@ 4.80	4.65@ 4.80
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia...	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.40	4.35
Pool 2, Hamp. Roads	4.25	4.20
Pools 5-6-7 Hamp. Rds.	4.10	4.10

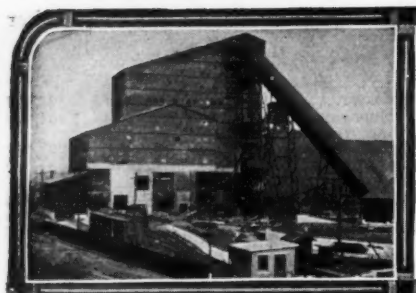
Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to *Coal Age*

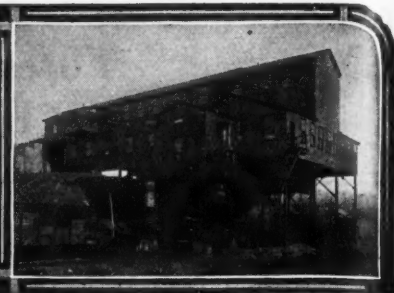
Cardiff:	Nov. 1	Nov. 8†
Admiralty, large...	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Steam smalls.....	16s.	16s.
Newcastle:		
Best steams.....	17s. 6d. @ 22s. 6d.	18s.
Best gas.....	20s. 6d.	21s. @ 21s. 6d.
Best bunkers.....	18s. 6d. @ 19s.	17s. 6d. @ 18s. 6d.

† Advances over previous week shown in heavy type, declines in italics.





News Items From Field and Trade



ALABAMA

Final details of the Sloss Sheffield Steel & Iron Co., Alabama Co. merger are being worked out in New York by officials of the two corporations and the agreement probably will be made effective Nov. 15.

Fire, said to have originated in the offices of the Piedmont Coal Co., at Dora, Walker County, Nov. 5, spread to adjoining buildings and caused damage estimated at \$40,000. Shortage of water necessitated the dynamiting of a building to stop the progress of the flames.

W. L. Smith and associates, operating the Raccoon Coal Co., at Altoona, in Etowah county, are now producing coal from their No. 4 mine at the rate of 150 tons per day, with the expectation of increasing the output to 500 tons per day soon.

A \$6,000,000 merger was effected Nov. 1 with the completion of negotiations by the Alabama Byproducts Corporation, controlled by Morris W. Bush and Horace Hammond, for the acquisition of the Pratt Consolidated Coal Co. and its subsidiary, the Globe Coal Co., of Birmingham, owned by George B. McCormack and Erskine Ramsay. The consolidated company will control 110,000 acres of land in Jefferson County with more than twenty mines having an annual output of 2,500,000 tons of coal. The Pratt Consolidated company had been on the market for some years, Messrs. McCormack and Ramsay having offered it to the Tennessee Coal, Iron & R.R. Co. and having on several occasions been in negotiation with the Walter Moore interests.

Fire of unknown origin starting in the commissary building of the American Fuel Co., Beltona camp, on the morning of Nov. 2, destroyed the building and contents and also supply houses, office and garages located nearby, entailing a loss estimated at \$50,000. Beltona is located in the northern section of Jefferson County. Employees of the company were unable to make any headway in fighting the flames on account of the scarcity of water due to the long drought. It is stated that construction of new buildings to replace the burned structures will begin at once.

ILLINOIS

The mine at Niantic, which has been closed since last April, is now hoisting coal regularly. Sixty men are employed, which number will be increased soon to 100. The coal is trucked to Decatur, ten miles east, where it will compete with the Decatur mined coal.

The Franklin County Coal Co. has made extensive improvements at its mine at Sandoval and expects to have it in operation soon.

The Wolf strip mine, near Belleville, just off the Freeburg-New Athens road is now in operation. A switch has been laid to the mine from the Illinois Central at Lementon.

A. A. Bryden, formerly Southwestern Sales Manager of the Southern Gem Coal Corp., at St. Louis, is appointed Southwestern Sales Agent for the Saline County Coal Co. of Chicago. He has offices in the Wainwright Bldg., in St. Louis.

George Adams, of Matherville, has been named manager of the Rex mine, near Warner. Mr. Adams takes the place of Thomas Mills of Rock Island, who was accidentally killed at the mine recently.

An investigation of the fire which destroyed the uncompleted shaft and works of the Devalley Coal Co., on the Urbana road six miles west of Danville, disclosed the fact that the fire not only was incendiary but that the bottom works were dynamited before the fire started.

The Lovington Coal Co. mine near Lovington, which was reopened by local capital late in September after having been shut down all summer, is closed again for lack of business.

A claim of \$200,000 against the defunct Southern Gem Coal Corporation has been allowed the Willis Coal & Mining Co., of St. Louis, Mo., by Judge English in the federal court of East St. Louis. Also the court permitted the Willis company to cancel a lease and take back full control of two mines in Perry County which the Southern Gem had never operated to any extent and which are now flooded.

James Steel has resigned as superintendent of the St. Paul Coal Co.'s mine at Ladd, and has removed to northern Wisconsin to reside. He has had charge of mines in the Ladd and Cherry regions for a number of years.

INDIANA

Three men were killed early this month in an explosion in the Blackhawk mine of the Miami Coal Co. twelve miles east of Terre Haute. The three were substitute shot firers on their first trip down, replacing men who had been injured in a blast in the mine only a few days previous. A windy shot is

thought to have caused the latest explosion.

New developments in the Sullivan County coal field are expected by a merger recently consummated. W. H. Leland, of Chicago, until recently, president of the W. H. Leland Coal Co., with mines in Kentucky, Indiana and Illinois, has joined forces with the J. Wooley Coal Co., one of the oldest individual companies in Indiana and a pioneer company in the Sullivan County fields. The company intends developing holdings in Sullivan County. A diamond drill is on the Wooley property testing underground conditions in that vicinity. J. D. McInnes, who for thirteen years has been with the Wooley company, has been retained as superintendent.

KENTUCKY

At Madisonville, the property of the Pontiac Coal Co. was sold at public auction on Nov. 4 to the Pontiac Coal Mining Co., for \$19,320. The property was sold to satisfy company creditors.

The Black Joe Coal Co., at Butterfly, Perry County, in the Hazard field, owned by the J. B. Stores Co., interests, Cincinnati, has been sold by the receivers to W. E. Davis, of the Midland Mining Co., at a reported price of \$26,000.

Recently the Franklin Circuit Court, at Frankfort, held a 1 per cent oil production tax unconstitutional. The case is pending in the Appellate Court, and a number of suits for recovery of taxes paid also are pending in state courts. Every Legislature in years has had a coal tax bill before it, but none has ever passed such a tax bill.

L. F. Brashears, of Hazard, was the highest bidder on the plant of the Harveyton Coal Co., at Harveyton, one of the properties of the J. B. Stores in the First Creek field, which went into hands of receivers about a year ago due to unsatisfactory business conditions. Mr. Brashears' bid was \$43,000. It includes the lease, mines, machinery, property and the commissary of the J. B. Stores. The mines have been operated by the receivers, J. B. Rickey and others, since last winter.

The Kentucky Washed Coal Co., at Nonell, which was out of the game for some months as a result of a landslide which wrecked its fine washer and tipple, is now producing heavily, its strip production on Oct. 29 totaling 31 cars of coal. A new washing plant, equipped with drying and dewatering systems,

is being installed by Krehbiel & Co., engineers, of Chicago, and will be in operation in December, replacing a temporary washer which has been in use since the plant resumed a few weeks ago.

MINNESOTA

An interesting talk on coal conditions in the Northwest was broadcast over the Twin City radio central, WCCO, last week by F. O. Brandt, of the Northern Coal & Dock Co., St. Paul. He touched upon the tendency to hold back in buying and the result of piling up orders when the rush comes, along with a possible turn of cold weather.

There has been a final attempt to meet the low prices on coal from western Kentucky over the L. & N. and the M. & St. L. to the twin cities district. Other roads evidently became tired of having an adverse competitive rate and started tariff rates to meet them for the entire Northwest. This started opposition from the coal trade, which did not want to have the rate fabric upset completely. The dock association and the Franklin County operators were agreed in opposition to this step and have initiated efforts to have the matter adjusted without a complete overturning of present rates.

NEW YORK

The Bethlehem Steel Co. has completed a new battery of 57 coke ovens at its Buffalo plant and will put in a second unit of the same size at once, replacing the old and somewhat out-of-date equipment formerly used. The company has its own mines and will use 1,000 tons of coal a day for coke making. The old process of 18 to 20 days now gives way to one that requires only 12 hours.

NORTH DAKOTA

The fire which has been burning for more than a year in the lignite mine of the Haynes Coal Co. has assumed serious proportions again. It was once thought to be in control but a breakdown of pumps permitted its further spread. There is some danger of the

fire getting across the state line—or under it—into the coal seams of South Dakota.

OHIO

A small mine of the Dean Coal & Coke Co., located at Moxahala, was sold at receivers sale Nov. 3 to Charles A. Bruner, of Columbus, at his bid of \$4,100. The property had been appraised at \$20,516.60. The new owner will operate the property to supply his retail business in Columbus.

Several coal mines in the Bailey Run field which has been almost completely idle for months, started recently, operators announce. More than 300 men were given employment.

Eight members of the mining division will meet during the week of Nov. 17 at Pomeroy to obtain specific instructions for the most extensive first-aid and mine rescue campaign thus far conducted in the state, Chief Watson announced. The following week the remaining nine members of the division will meet at Cambridge to learn of such plans for their respective districts.

Fire, said to have been of incendiary origin, on Nov. 1 completely destroyed the tippie, power plant and other surface buildings at the Middle States Coal Co.'s Mine No. 24, near Jacksonville. A presumed attempt also was made at the same time to destroy the tippie of the company's Mine No. 68, about a half-mile south of No. 24, by use of explosives. Little damage was done at Mine No. 68, but the loss at Mine No. 24 is estimated at \$60,000, the tippie having been old but in good repair. Trouble is said to have arisen over the use of mechanical loaders and the operation of the mines on a co-operative basis, with the result that about one hundred men formerly employed at the mines were thrown out of employment. The leasors of the mines assert that the union scale was being paid for all hired day men.

Jerome Watson, Chief Deputy of the Ohio Department of Mining, has discovered that fire is still burning in the Doanville Mine which started Dec. 19, 1920. The openings were sealed up at that time and it was believed that the

fire had been extinguished but upon opening it recently it was still smouldering. Efforts will be made to fight the fire in order to get the mine in condition for operation.

PENNSYLVANIA

Failure of the Legislature to make a specific appropriation for conducting examinations for the office of state mine inspector has placed Joseph J. Walsh, head of the Bureau of Mines, and his department in a rather embarrassing situation. It is understood that the state Department of Mines and Mining is without sufficient funds with which to conduct the examinations, defray the expenses of a hall, etc. As a result, Chief Walsh has had to turn to the state Department of Education for aid.

Dr. W. S. Blaisdell, a well-known coal operator of central Pennsylvania, was elected to the state Senate from the Indiana-Jefferson County district in the Republican landslide last week. The term is four years, during which there are two sessions of the Legislature.

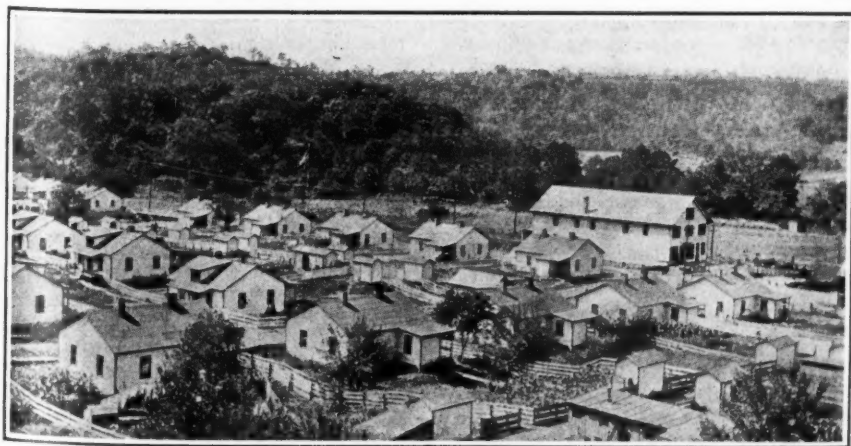
Erection of a breaker has been started near Shamokin by Madiera, Hill & Co., owners of collieries at Natalie and Greenough. The new breaker, which is to be of steel construction and equipped with the most modern machinery, is intended to prepare the product of both the Natalie and Greenough mines, taking the place of the antiquated breakers now in operation at these collieries. These will be destroyed as soon as the new breaker starts in operation. The company has already erected an office building and a mule barn near the site of the new breaker.

The Susquehanna Collieries Co., has begun an improvement campaign in the collieries in the Mount Carmel section. The Richards Shaft, which is particularly gaseous, has a new fan with a capacity of 150,000 cu.ft. per minute. It is run by electricity furnished by the mammoth power house of the company. An even larger fan will soon begin its work of clearing the mines of gas and circulating air through the workings at the Scott colliery and the Pennsylvania colliery also will be equipped with a similar fan.

The Warner Youghiogeny Coal Co. of Pittsburgh, has contracted with the Roberts & Schaefer Co. for the installation of Marcus screens and R. & S. loading booms in its tippie at Charleroi.

Four men were seriously burned in an explosion Nov. 5 in the mine of the Hustead-Seamons Coal Co., at East Millsboro, 1½ miles from Brownsville. The men were drilling with an electric drill, it is believed, when a spark from the machine ignited a gas pocket. A sheet of flame enveloped the room. The miners were hurled to the floor of the coal seam, their clothing on fire. The explosion did not extend beyond the one room, and did not damage the workings.

The old Neilson mine in the western portion of Shamokin, which was aban-



Portion of Louise Town Site

Courtesy of Bertha-Consumers Co.

This modern mining camp is at the Louise operation of the Bertha-Consumers Co., located at Louise, Brooke County, W. Va. The mine has a daily capacity of 1,500 tons.

done in 1902 during the miners' strike, has been taken over by a group of outside capitalists and operations will be resumed in the near future. New rock slopes are planned and modern hoisting machinery also will be installed. The company which has taken over the mine also has obtained valuable concessions from the Susquehanna Collieries Co. and the Lehigh Valley Coal Co. It is expected the new working will give employment to between 1,000 and 1,200 men and boys.

A tribute to the popularity of W. J. Richards, president of the Philadelphia & Reading Coal & Iron Corporation was paid in the Pottsville field on election day. Mr. Richards was one of the Republican electors in Pennsylvania and he received hundreds of votes above the totals cast for the 37 others on the ticket. In Post township, Schukill County, more than 100 Democrats, all coal miners, split their tickets so that they could vote for the coal operator.

Announcement has been made by the Philadelphia Coal & Iron Co. of the promotion of Richard F. May, assistant to the division engineer in the Shamokin district to the post of division engineer in the Mt. Carmel field. Mr. May succeeds Albert R. Harris, who has been advanced to the position of general superintendent of the Locust Gap colliery.

UTAH

J. A. Stallings, sales manager of the Spring Canyon Coal Co., Salt Lake City, is described as a "very sick man." Mr. Stallings has been ill for some months, but recently returned to his desk for a short time in an unsuccessful effort to attend to his duties. He is now in the hospital.

Approximately 160 acres of coal land in Grand County is to be offered for lease by the register of the Salt Lake Land Office, Nov. 17. The lease is made on application of John G. Adams. The terms are a royalty of 10c. per ton of coal mined, for production in the fourth year after the lease of 1,600 tons and for expenditure of not less than \$3,000. The lease will be awarded the person or persons bidding the highest premium above these terms.

WASHINGTON

Enrollment is fairly heavy in the night schools conducted by the Pacific Coast Coal Co. for its employees in the mining towns of Carbonado, Black Diamond, Burnett, Newcastle and Issaquah. These classes, open to any employee, have been running for two years, offering grade school work and especial aid for foreigners who wish to become American citizens. This work is directly in charge of H. J. Hoff, a graduate of Bethany College, Lindsborg, Kan., who has studied in Germany, Russia, Italy and France and who received the degree of doctor of philosophy at the University of Illinois in 1908. He is assisted by R. R. Sterling, a graduate mining engineer, and by Mrs. C. C. Christenson, a graduate of Oberlin College.

WEST VIRGINIA

All records for the shipment of coal from Norfolk & Western Ry. territory during the last two years were broken in October, it has been announced by the company. The company handled 62,731 cars, or more than 3,000,000 tons of coal, between Oct. 1 and 28.

W. A. Phillips, president of the Pemberton Coal & Coke Co., in the Winding Gulf District; of the Ashland Coal & Coke Co., in the Pocahontas district, and Majestic Colliery Co., located in the Williamson field, is still a patient at the Lankenau Hospital, in Philadelphia. The home of Mr. Phillips is at Mt. Carmel, Pa.

The following changes have been made in the operating organization of the Elkhorn Piney Coal Mining Co.: Lew Roach, formerly general superintendent of the Powellton (W. Va.) division, has been promoted to general manager of all mines, vice D. R. Phillips, resigned. Mr. Roach will continue his office at Powellton. J. W. Allstock, formerly mine superintendent at the Weeksbury (Ky.) division, has been promoted to general superintendent of the operation of Stanaford, W. Va., vice F. M. Addis, resigned.

WISCONSIN

The C. Reiss Coal Co. docks and two ore docks belonging to the Chicago Northwestern R.R. at Escanaba were damaged by fire Oct. 31. A fireman lost his life and property estimated to be worth \$2,000,000 was wiped out. A huge stock of anthracite on the Reiss dock was partly reduced by the flames. Several days' work was necessary to save the unburned part of the stock.

WYOMING

The Union Pacific Coal Co. is co-operating with the city of Rock Springs in preparing plans for a city sewerage system and in the diversion of Bitter Creek from the center of the city to the northern and eastern side of Rock Springs. The project will cost several hundred thousand dollars.

The Lion Coal Co., operating at Lionkol, in the Rock Springs district, on Oct. 31, closed its properties at that place for an indefinite period, giving no reason for the shutdown. The properties have a production of from 1,200 to 1,400 tons daily, employing 155 men. The Union Pacific Coal Co. properties also were working slack the latter part of October, light freight shipments lessening the demand for their output.

The Union Pacific has discontinued fuse shotfiring in the Rock Springs district and has returned to electrical firing by a shotfirer after the day shift goes off.

CANADA

Howard Stutchbury, coal commissioner for Alberta, in reply to an inquiry from the Federal Coal Committee at Ottawa as to whether the Alberta mines could supply coal to central Canada this winter, stated that al-

though production would be much below normal there is no reason why a considerable tonnage should not be available for Ontario provided freight rates are adjusted, the present rate of \$12.70 per ton being prohibitive. Production in Alberta will be speeded up if due notice of Ontario requirements is received.

The total output of the Dominion Coal Co. for September was 273,374 tons an increase of about 40,000 tons over the August output but less than the production of September, 1923. The success of the longwall system of mining at Sydney Mines has encouraged the management to put it into operation in other collieries.

The operators of all the mines in the Edmonton coal field, with the exception of the Penn mine, have expressed their intention of signing a contract with the miners on the terms of the award of the conciliation board. There will, therefore, be no walk-out, not even at the Penn mine, according to officials of the Edmonton District Federation of Miners.

Premier Greenfield, of Alberta, has announced that the following will compose the commission to investigate the coal-mining industry of the province, in accordance with a resolution passed at the last session of the Provincial Legislature; S. M. Evans, of Edmonton, chairman; R. G. Drinnan, director of the Mountain Park Collieries and of the Luscar Collieries, and Frank Wheatley, president of the Alberta Federation of Labor. The commission will start work at once and will thoroughly probe all phases of the coal-mining industry in Alberta.

New Companies

The Richard Coal Co. has been organized at Huntington, W. Va., with a capital stock of \$100,000. Chiefly interested in the new company are R. H. Williams, T. J. Fisher, J. F. Eaton, J. W. Fitchett and M. L. Burnett, all of Huntington.

The Gould Road Coal Co., 102 N. 3rd St., Steubenville, Ohio, has been chartered with a capital of \$30,000 to mine and deal in coal at wholesale and retail. Incorporators are: Andrew Pipo, Harley S. Thompson, Clyde Robeson, William Jacobs, John Hostovitch and Marshall N. Duval.

The Harmon-Burton Coal Co., Zanesville, Ohio, has been incorporated with a capital of 1,000 shares, no par value designated, to mine and deal in coal and coke. Incorporators are: William S. Harmon, H. P. Dean, Robert E. Marshall and Emmet R. Curtin, Jr.

The Lyell Coal Co., of Huntington, has obtained a charter providing for the issuance of 400 shares of stock of no par value. The incorporators are connected with the W. E. Deegans coal and mining interests of Huntington, where the new company will have offices in the Deegans Building. The company will operate mines on Keeney's Creek. Incorporators are: J. F. Grimet, I. F. Vass, A. W. Fitzwater, H. N. Priddy and F. H. Hall.

The Lincoln Coal Co., Covington, Ky., capital \$250,000, has been chartered by Irvin Davis, August Helm and H. H. McLean.

The Black Diamond Coal Co. of Gravity, Iowa, has been incorporated with a capital of \$50,000, to mine and sell coal. The company has the following officers: E. D. Morris, president; George W. Evans, vice-president, and H. E. Davidson, secretary-treasurer. The company has sunk a mine, finding a 26- to 28-in. vein of coal at a depth of 200 ft.

Traffic

New Coal Rates Approved by New York Commission

The New York State Public Service Commission has approved the new tariff schedule of the Buffalo, Rochester & Pittsburgh R.R. on coal (anthracite, pea and smaller sizes), carloads minimum weight marked capacity of car, except that when car is loaded to full visible capacity actual weight will apply, from Le Roy to Buffalo, \$1.76 per ton. The new rate became effective Nov. 1, 1924, P. S. C. No. 2022.

The commission also has approved the tariff of the New York Central R.R. (East) on coke, coke breeze and coke dust, carloads minimum weight in open cars 50,000 lb. (except that when car is loaded to cubical or visible capacity actual weight will apply, but not less than 35,000 lb.) and in box or stock cars 40,000 lb., from Buffalo, East Buffalo and Harriet to Green Island and Troy \$2.90, a reduction of 50c. per net ton. The rate becomes effective Nov. 28, 1924. Sup. No. 1 to P. S. C. N. Y. C. No. C-148.

Indiana Rate Order Modified

Modification of the order in the matter of Indiana rates, so as to except from its provisions certain intrastate rates applicable between points in Indiana, has been ordered, upon rehearing, by the Interstate Commerce Commission. The modification is as follows:

"We are of the opinion and find that the rates and charges for the transportation of coal from mines in the Linton, Brazil and Princeton districts in Indiana to Irvington, Ind., and from the Linton district to Putnamville, Ind.; for the transportation of coke from Indianapolis, Ind., to Irvington; and for the transportation of straw, in carloads, from Veedersburg, Hillsboro and Layton, Ind., to Marion, Ind., in effect on Jan. 28, 1921, did not cause any undue or unreasonable advantage, preference, or prejudice as between persons or localities in intrastate commerce, on the one hand, and intrastate or foreign commerce on the other, or any undue, unreasonable, or unjust discrimination against interstate or foreign commerce. Our order will be modified accordingly."

C. & O. Lowers Through Rates To Northwest

New and lower rates to approximately 2,100 points of destination in the states of Iowa, Kansas, Minnesota, Missouri, Nebraska, North and South Dakota are to go into effect on Dec. 5 on the Chesapeake & Ohio Ry., according to an announcement just made by A. M. Dudley, general coal freight agent of that road. The changes were made to meet those now in effect from points on the Louisville & Nashville R.R. Among some of the rates to representative points from mines in the New River field are the following: Cedar Rapids, Iowa City, Marshalltown, Ames, Des Moines, Waterloo, Iowa,

\$4.68; Clinton, Iowa, \$4.32; Council Bluffs, Iowa, \$5.53; Omaha, Neb., \$5.53; Mason City, Iowa Falls, Iowa, \$5; Sioux City, \$5.97; Winona and Rochester, Minn., \$5.09; Mankato, Minn., \$5.15; Springfield and Minneapolis, Minn., \$5.55; Marshall, Minn., \$5.62; Ghent, Minn., \$5.87; Porter, Minn., \$6.08; Watertown, S. D., \$6.14; Pierre, S. D., \$7.23; Aberdeen, S. D., \$6.56; Houston, S. D., \$6.73; Oakes, N. D., \$6.93; Kansas City, St. Joseph and Dearborn, Mo., \$5.53; Bettendorf, Muscatine and Davenport, Iowa, \$4.20; Ottumwa, Iowa, \$4.56; Leavenworth, Kan., \$5.53; Waterloo, Iowa, \$4.68. Rates from the Kanawha district to the points mentioned are 15c. a ton less.

Obituary

J. F. Healy, chief engineer of the Hutchinson-Island Creek Coal Corporation, of Omar, W. Va., died suddenly Nov. 1 at Omar. He was born in Blossburg, Pa., sixty-four years ago and was a graduate of Pennsylvania State College. For many years Mr. Healy was connected with the Davis Coal & Coke Co. and for a time was general manager of the Davis Colliery Co. For a time he was allotment commissioner of the Chesapeake & Ohio, afterward becoming connected with the Main Island Creek Coal Co.

Charles D. Jenkins, secretary of the Monongahela Coal Association and long identified with the business life of Morgantown, W. Va., died at the county hospital at Morgantown within 24 hours after suffering a cerebral hemorrhage at his office. Mr. Jenkins, who was 60 years of age, was a native of Randolph County but had been connected with various enterprises in Morgantown for a period of more than 20 years. He also was manager of the Morgantown Brick Co., and secretary of the Morgantown Country Club. At one time Mr. Jenkins was associated with the late John A. Clark of Fairmont in the coal business. A few years ago he was identified with the North American Coal Co., continuing with that concern until it was absorbed by B. M. Chaplin and associates.

An unusual career was brought to a close with the passing of **Dr. Bruno V. Nordberg**, founder of the Nordberg Manufacturing Co., Milwaukee, Wis., whose death occurred Oct. 30, at the age of 67. For more than forty years he was closely associated with engineering progress in the power and mining machinery fields. He was born in Finland in 1857, was graduated from the University of Helsingfors in 1878 and came to this country in 1880.

Death recently claimed **W. G. Robertson** of Scranton, Pa., who was prominent in coal mining circles here for almost 50 years. In that time he served as a mine foreman, engineer, coal operator, etc. For a time he also was Director of Public Works in the city of Scranton. He was buried at Dunmore, Pa.

Coming Meetings

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society of Mechanical Engineers. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

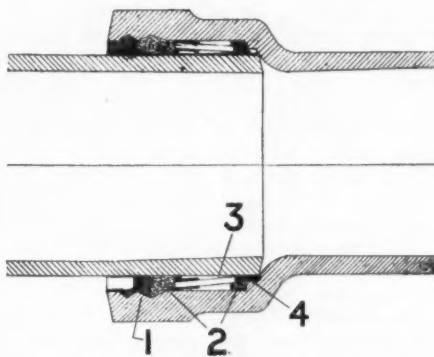
West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

New Equipment

Precalced Cast-Iron Pipe

Two features differentiate the cast-iron pipe manufactured by the McWane Cast Iron Pipe Co., of Birmingham, Ala., from the standard product. The first is the fact that small sizes—1½-, 2- and 3-in. pipe are made; second that all pipe has precalced joints.

The precalced joints greatly increase the ease and speed with which the pipe is connected, and eliminate the need for tediously pouring lead joints in the field, a job of no small dimension where the pipes are small and their lengths short. It is stated that this combination of bell-and-spigot joint, factory-



Can Install This Cast-Iron Pipe with Little Labor

By having most of the joint formed at the factory this cast-iron pipe may be easily put in position on the job. This is an important detail when rapid progress must be made, especially in cold weather.

made, with short lengths of pipe cast by the McWane green-sand process, overcomes the difficulty occasioned by the brittleness and lack of flexibility of small cast-iron pipe lines.

This small pipe, offering the high resistance of cast iron to the corrosive action of soil, water, and acids already has been used extensively by many mines and industrial establishments in place of wrought-steel or iron pipe.

In the 4- and 6-in. sizes the pipe is made in standard 12-ft. lengths. These sizes, too, are equipped with the precalced joint which is made about a mandrel while the pipe is in a vertical position. The mandrel, being slightly larger than the spigot end of the pipe it represents, provides ample clearance for entry of the latter. In the order named, braided jute, a specially-prepared ring of iron wedges embedded in lead, two more braids of jute, and a final filling of molten lead, are placed in the pipe bells around this mandrel. What will be the lower half of the joint circumference is then precalced.

Fig. 1 shows the precalced side downward. Driving the lead in at the top forces the pipe down to a firm seat at the bottom, and a positive joint results.

It will be observed that this is not



Materials Used When Making the Precalked Pipe Joint

For gas joints an extra lead ring is supplied. It can be slipped over the spigot end of the pipe and forgotten until the joint is completed in the regular way.

simply a lead joint, but a combination lead-and-jute joint. The quantity of lead is gaged so that the force of the blows in calking extends through the lead to the top jute and thence through the wedges to the bottom jute, the latter being forced by the wedges into the groove shown at the base of the bell. This gives three points at which the water or gas is held, the bottom jute, the top jute and the lead.

The function of the wedges is not only to carry the force of the blow from the top to the bottom of the joint, thus insuring tightness and rigidity, but also tighten automatically the joint materials in case of external stresses that might tend to deflect the line. When such stresses occur the end of the pipe at the joint subjected to strain tends to go down and the point at 1 tends to come up. The compressed jute at the bottom of the bell resists this tendency, but if the strain should be such as to deflect the joint slightly the bottom jute will be further compressed and will force back the wedges at the bottom of the joint, 3, thus compressing both layers of jute at 2.

Laying precalked joint pipe is therefore a process of finishing, rather than making, the joints. The calker is the first and only man needed after the spigot end is slipped into the pipe bell. The lead-pourer, varner and bell-hole digger are not needed, all their work previously having been done by the manufacturer, and the joints delivered ready to calk. It is estimated that the labor of two men is saved in the average pipe-laying job.

Put the Little Hoist Where Headroom Is Low

The Lo-Hed mono-rail electric hoist, designed and built by American Engineering Co., of Philadelphia, is a general purpose hoist with a number of important and exclusive features.

It differs radically in design from other electric hoists. An outstanding feature is that it is claimed it operates under low head room. The motor and drum are arranged on opposite sides of, and parallel to, the I-beam rail and the load block can be drawn up between them, into the body of the hoist until it practically touches the bottom of the rail.

The space taken by the 1-ton plain trolley hoist under the beam is only 10 in. while the 3-ton plain trolley requires only 14 in. As a result the hoist can be used in many places where other units could not meet the head room conditions, especially where ceilings are low, bulky loads are handled,

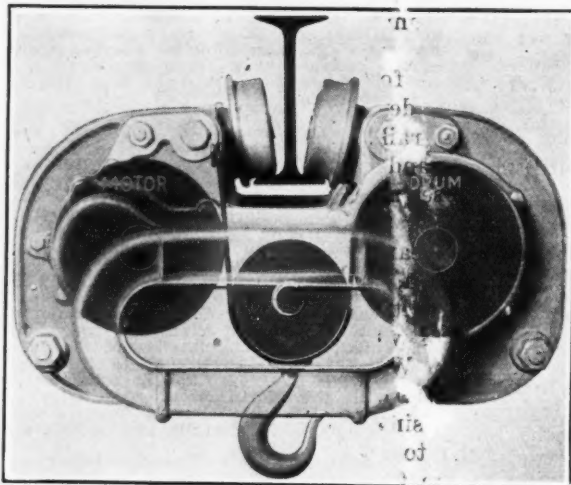
obstructions must be cleared, or where large size pieces must be placed on machines and trucks.

Another important feature is the complete and easy accessibility of all working parts. By simply removing the outer covers, which can be done in a few minutes, all parts of the hoist can be inspected, and, if necessary, any part can easily be removed. The motor, for example, can be taken out in a few minutes without disassembling

of standing up under the severest conditions to which a hoist can be subjected. Only the best materials and workmanship are used. All gears are of drop forged steel. Positive automatic lubrication is provided. Hyatt High-Duty bearings are used on all gear shafts and the trolley wheels, thus reducing friction to a negligible quantity. Automatic lowering brake, of drop forged steel, holding brake and upper limit switch combine to assure safe operation at all times. Brakes take effect instantly, stopping the load without drift and affording unusually sensitive control.

The complete unit has a mechanical efficiency of over 80 per cent and a factor of safety of at least five at full load.

It is built in sizes of 1,000 to 12,000 lb. capacity. There are five types for either a.c. or d.c. The first four types are arranged for operation from the ground. The various types are as follows: (1) Bolt suspended, (2) plain trolley, (3) hand-gear trolley, (4)



Phantom View

Because the hook of this hoist can be nearly bumped against the I-beam it can be used in places having low head room.

the main frame or body of the machine, and either with or without a load on the hook.

In addition to these features the hoist is built with the idea of making it a quality piece throughout, capable

motor-driven trolley, (5) cab controlled, motor-driven trolley, with either open or inclosed cab.

Two or more hoists can be hooked up in tandem and the capacity increased accordingly.

Motor-Driven Trolley Type

Maximum service and utility of space is obtainable with a hoist which can lift and carry material close to the roof. Cabs for both indoor and outdoor service keep the operator out of rain and cold.

